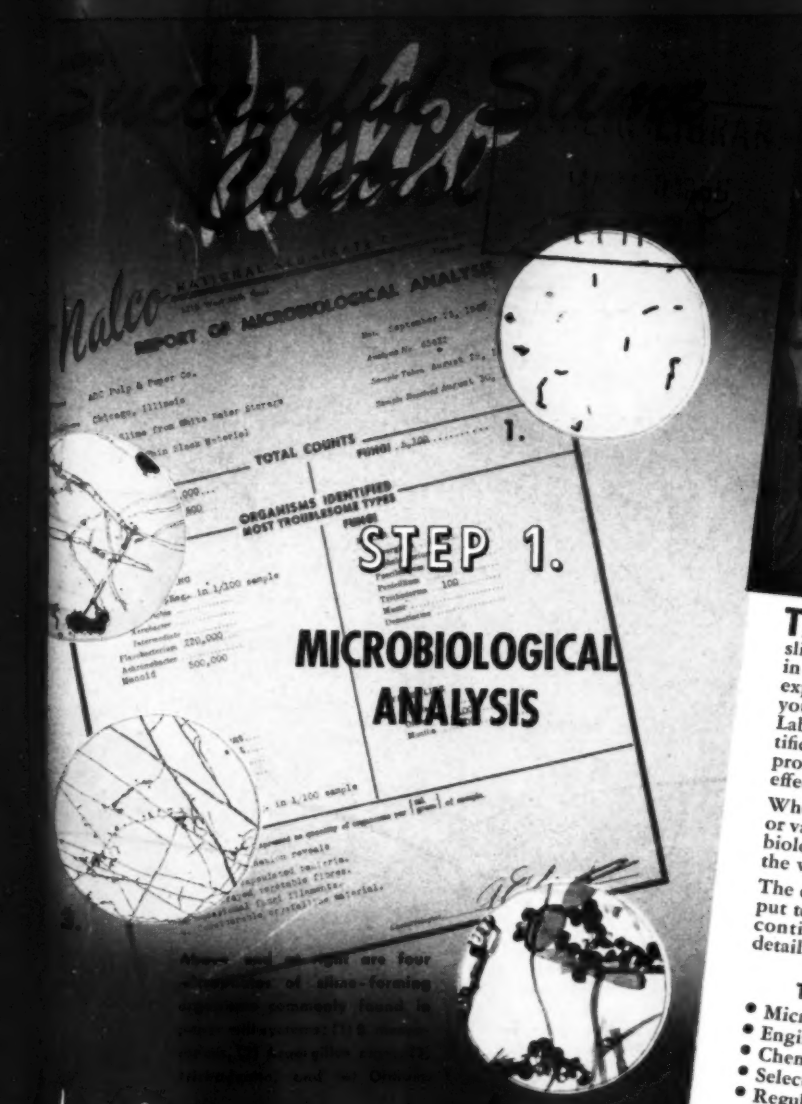
MARCH 1955

The Paper Industry



THE Nalco-developed method of identification of slime-forming organisms is the important first step in the Nalco System of *successful* slime control. Nalco experts collect samples at proper points throughout your mill. These samples are analyzed in the Nalco Laboratories, where the finest equipment and scientific skill insure correct reports. Analysis reports provide a firm base upon which to recommend effective, economical slimicide treatment.

Where bacterial conditions change with the seasons, or vary due to local conditions, routine Nalco microbiological analyses detect these changes and point the way to successful year-around slime control.

The complete Nalco System, outlined below, can be put to work in your mill on short notice to provide continuing, successful slime control. Write for details today.

The *Nalco* System of Slime Control

- Microbiological Survey.
- Engineering Survey.
- Chemical Survey.
- Selection and application of treatment.
- Regular service calls, routine analyses, and mill checks.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois

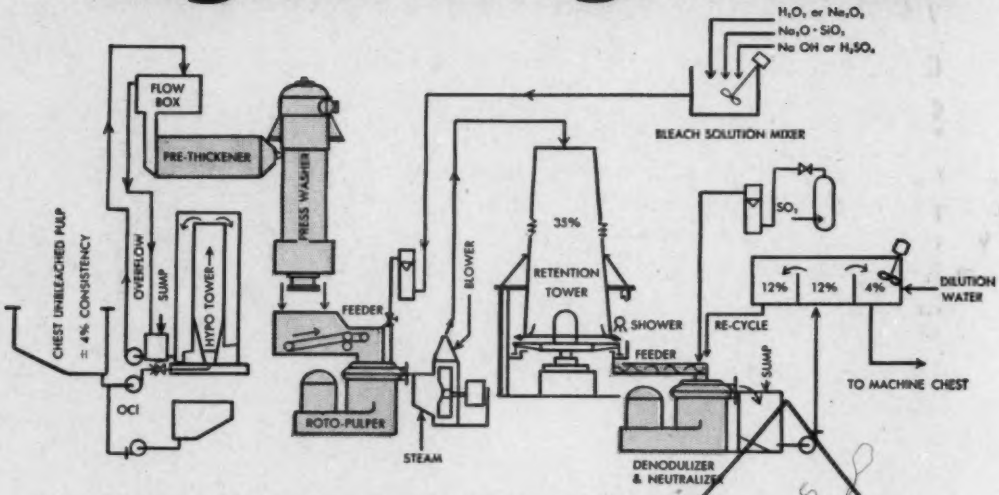
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

Nalco

now you can have both...

lowest cost

higher brightness



in the new J-C groundwood bleaching system!

For four years J-C's single stage groundwood bleaching system has provided high brightness at reduced costs for various mills.

Now a new and better process . . . the dual-stage system . . . has been perfected by J-C engineers to give outstanding savings in chemical consumption and greater increases in brightness.

Look over this list of reasons and see for yourself how this new process produces a better product at a far lower cost.

fully continuous, precision controlled system
low initial investment
much lower operating costs per ton
minimum floor space
sharply reduced yield loss
maximum brightness
minimum color reversion
unchanged pulp physicals
one operator per shift
freedom from knots and "fish eyes"

Your nearest J-C representative will tell you how it is done!

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46 Trinity Place
New York 6, N. Y.
Phone BO 9-6496
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Homad Services Ltd.
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Phone Tampa 8-3952

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San Francisco 11, Calif.
Phone Yukon 6-1611

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Phone KE-7098

J-C

JACKSON & CHURCH CO. SAGINAW, MICHIGAN

Work well done since eighty-one

Inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

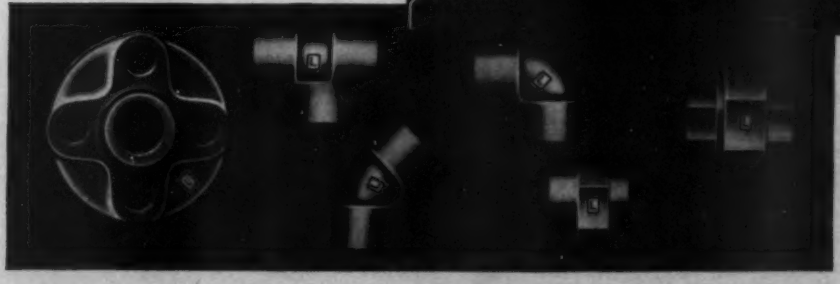
LUNCOR PVC VALVES REPLACE HIGH-ALLOY VALVES

Also Replace Valves Lined With Glass, Porcelain, Stoneware, Hard Rubber At Substantial Savings

LUNCOR is the first all-molded PVC valve designed and engineered by a valve manufacturer. LUNCOR PVC is a strong, rigid type of unplasticized polyvinyl chloride. The valve design has been created to take full advantage of the properties of PVC. LUNCOR PVC can be molded to precise tolerances and is remarkably corrosion-resistant, odorless, tasteless, non-toxic, non-porous, non-contaminating, and weighs only one-sixth as much as metal. The new valve, with its full line of fittings, permits ready installation of complete plastic piping systems.

Every part is made of all molded LUNCOR PVC . . . body, bonnet, disc, stem, and handwheel. Packing is self-lubricating Teflon.

FIG. 2600
125 WP
140°F.



LUNCOR FITTINGS

The complete line of fittings which complements the new LUNCOR Valve includes: caps, couplings, plugs, unions, reducing bushings, flanges, elbows, and tees. LUNCOR Fittings are made of the same high-quality rigid polyvinyl chloride as the Lunkenheimer LUNCOR Valve.

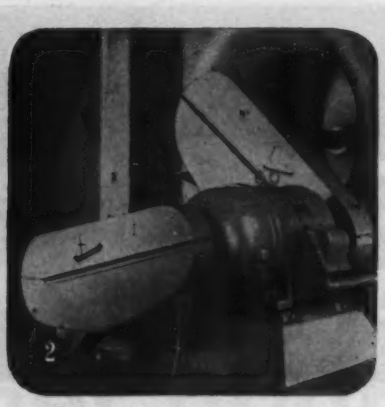
REQUEST LITERATURE FROM YOUR LUNKENHEIMER DISTRIBUTOR OR FROM THE LUNKENHEIMER COMPANY, BOX 360, CINCINNATI 14, OHIO.

LUNKENHEIMER®

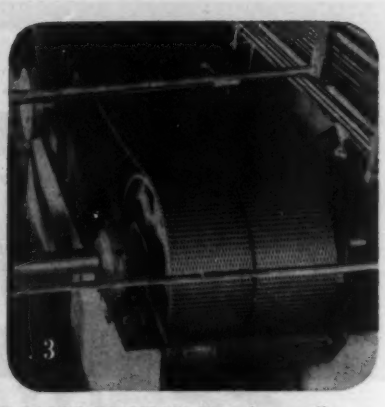
THE ONE *Great* NAME IN VALVES

L-200-55

1 ADVERSE OPERATING CONDITIONS. Humidity, heat, cold do not lower Link-Belt Silent Chain's better-than-98% efficiency.



2 UNFAILING SAFETY. Dependability assures continued production. On above tunnel ventilators, Link-Belt drives protect human life.



3 LARGE OR SMALL HP. A versatile line, Link-Belt Silent Chain drives are available from fractional to thousands of horsepower.

4 LARGE RATIOS. Link-Belt Silent Chain operates efficiently on extremely short centers at ratios as high as 10-to-1.

5 LIMITED SPACE. Easy to assemble in close quarters, Link-Belt Silent Chain permits built-in drives, compact housings.

6 HIGH SPEED. After 13 years on this newspaper press at speeds up to 4700 fpm, Silent Chain is still efficient.

Big reasons why LINK-BELT Silent Chain

is specified for so many drives:

WHEN using a Link-Belt Silent Chain Drive, you can look forward to better-than-98% efficiency throughout its long operating life. What's more, silent chain offers the sureness of positive tooth-to-tooth action plus the flexibility of a belt. As for economy, silent chain is often lower in cost than other drives far less efficient.

Find out for yourself why so many of today's demanding drives incorporate Link-Belt Silent Chain. Ask your nearest Link-Belt office or distributor for Book 2425, containing complete information.

LINK-BELT

SILVERSTREAK SILENT CHAIN DRIVES

Here's why LINK-BELT Silent Chain offers you more drive per dollar

- Lower cost—often lower in first cost, always lower in ultimate cost.
- Longer life—trouble-free performance for 20 to 30 years is common.
- No dismantling machine or removing sheaves for repairs.
- Better than 98% efficiency.
- Maintained ratio assures full productive capacity.
- Slipless action assures a better product.
- Easy to install.
- Safe to employees—operates in oil-retaining casing.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,710

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Technology • Engineering • Management • Production

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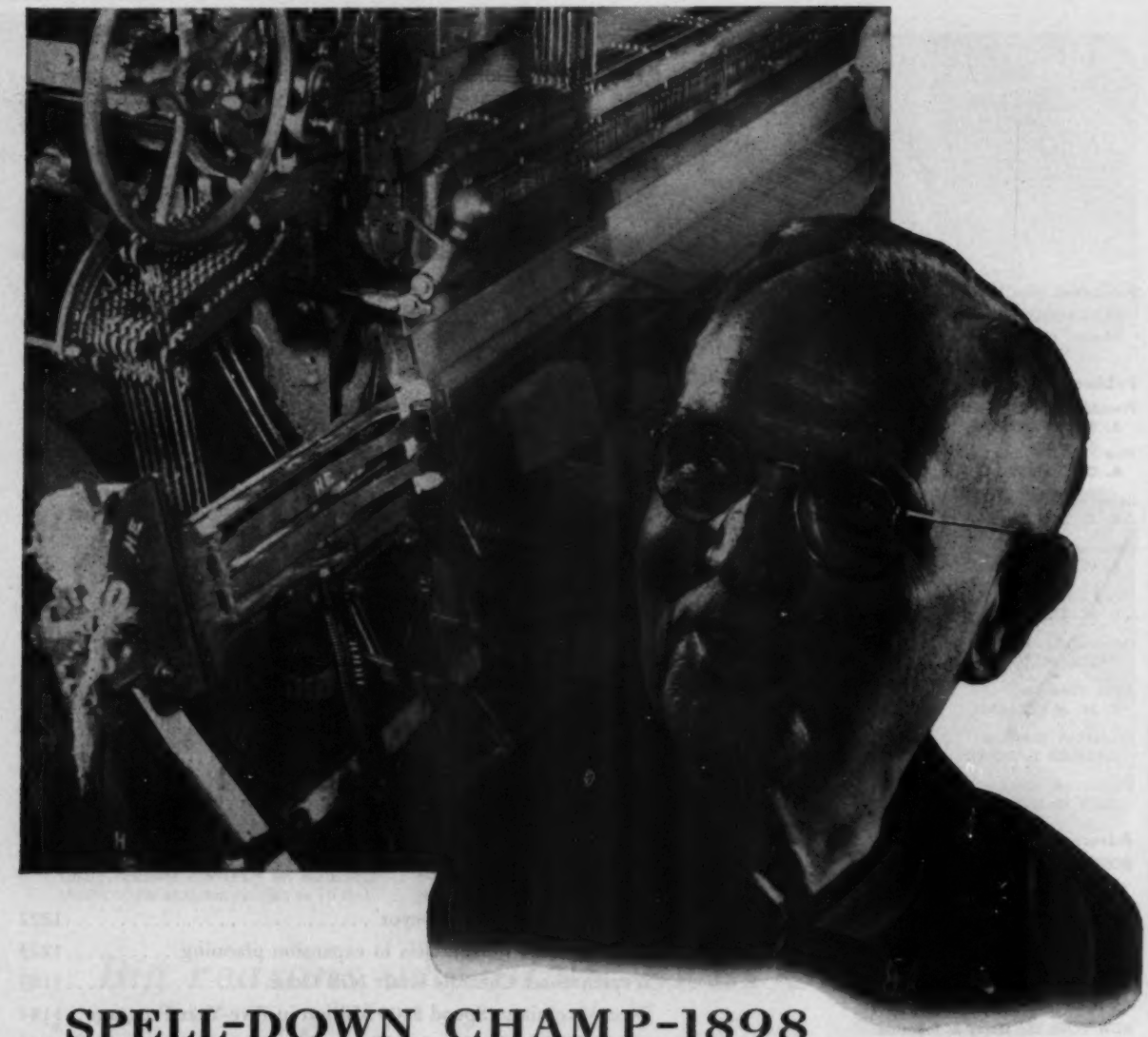


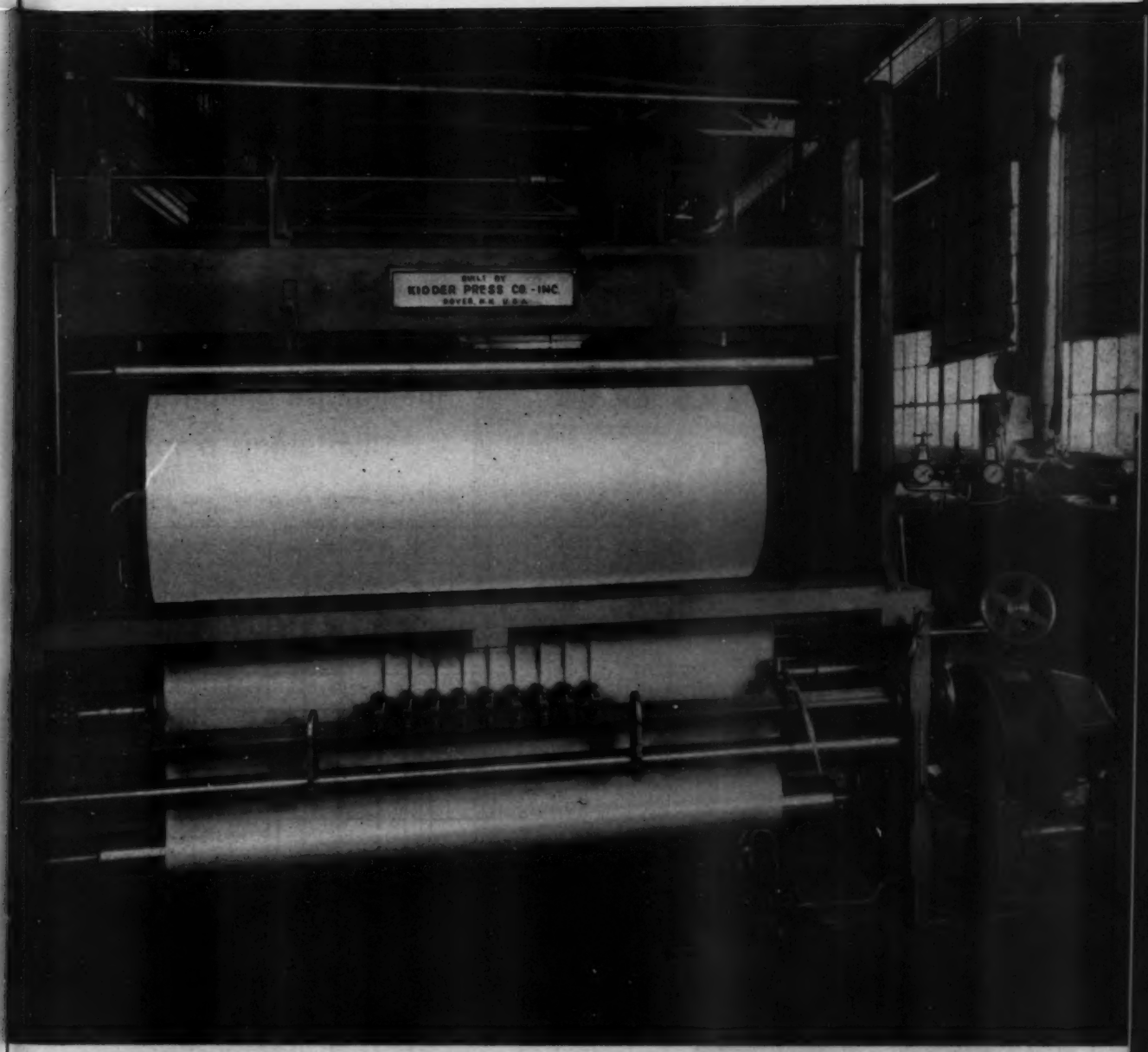
SPELL-DOWN CHAMP-1898

Here's good-natured Joe Becher. As a boy, he was a great speller in school—and great to take off afterwards with pole or gun. And for 53 good years, Joe's well-rounded abilities have been important to efficient felt-making. First a spinner, then a weaver, Joe is a top loom-fixer now—keeping looms steadily on the job of putting a perfect, uniform weave into Appleton felts.

The skill and experience of Joe Becher, and others like him, are characteristic of the Appleton Woolen Mills . . . a 73-year-old organization dedicated to development, progress, and the production of ever finer felts—for the finest paper-making.

APPLETON WOOLEN MILLS

APPLETON. WISCONSIN



No Other Slitter offers you the cost-cutting, gearless construction of the Kidder Model G. T. Many other advancements make it ideal for handling stock ranging from 200 pound tag to the lightest tissue.

When you're measuring slitting-accuracy in thousandths...

nothing can equal Kidder shear cutting. On this Kidder Model G. T. Slitter, for example, the back cutters controlling the width of cut cannot move, and the front cutters are self-sharpening. This advanced shear-cut method — standard on all Kidder Slitters — assures maximum accuracy, long service life, dust-free slitting and positive roll separation.

In addition, the Model G. T.'s gearless drive design (introduced by Kidder in 1949) plus anti-friction bearings and dynamic balancing help keep maintenance at its very lowest.

These are just a few of the reasons why you can count on the Model G. T. Slitter for continuous high speed, high production operation, with negligible down time. For full particulars on the Model G. T. and on all Kidder Slitters and Winders, write to Kidder Press Company, Inc., Dover, New Hampshire.

Kidder

3 POINT SLITTERS

High Speed Operation
Dust-Free Cutting • Easy Roll Separation

ENGINEERED AND BUILT BY

PERKINS

EXPERIENCE
+QUALITY=
PERFORMANCE

B. F. PERKINS & SON, INC.

HOLYOKE · MASSACHUSETTS

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LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

51 UNIT ROSS Air System for BOWATER'S

Largest installation of air handling equipment for a single mill!

ROSS units are helping to insure maximum operating efficiency in all major departments of Bowaters new mill at Calhoun, Tenn.

Machines—17 units Machine Room—20 units
Stock Preparation—4 units
Pulp Dryer—2 units Grinder Room—2 units
Brown Stock Washing—2 units Bleach Plant—4 units

In addition to the ROSS Air System, the ROSS Pulp Dryer and the dryer sections of both machines are equipped with Ross Midwest Fulton Drainage and Steam Control Systems. The important assignment given to ROSS equipment in this notable Bowater project is one of which we are justly proud.

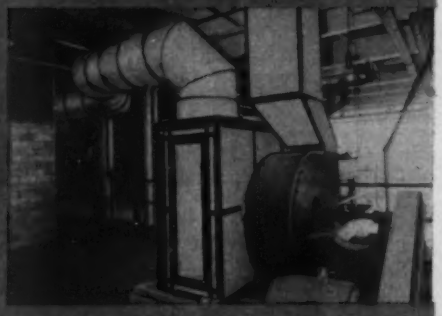
9-Pass ROSS Pulp Dryer

Hood Cooler Outlet

Brown Stock Washer Hood and Exhaust

Ventilating Apparatus in Control Room

Heating and Ventilating for Stock Prep. Room



Bleach Washer Exhaust Apparatus

ROSS SYSTEMS

J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

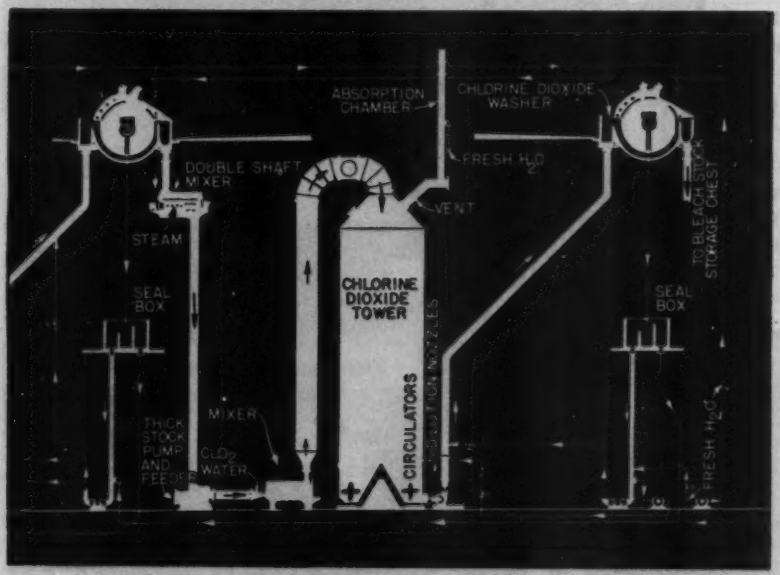
444 MADISON AVENUE NEW YORK 22, N. Y.

ATLANTA • BOSTON • DETROIT • CHICAGO • SEATTLE • LOS ANGELES

ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

90 G.E. BRIGHTNESS

with IMPCO CHLORINE DIOXIDE BLEACHING SYSTEM



PLUS

- Highest Brightness
- Excellent Pulp Quality
- No Strength Loss
- Low Chemical Costs
- Reduced Pulp Shrinkage
- Lower Solids to Sewer
- Fits Any Existing System

With the advent of chlorine dioxide bleaching in the United States, IMPCO studied the problem carefully and tailored the first working high density system. This pioneering unit was installed in a prominent mid-southern kraft mill with outstanding results. Since that time IMPCO systems have gone into operation on soda, sulphite and semi-chemical pulp. This continuous high density process has produced successful results from the very beginning and today 22 IMPCO systems are bleaching over 6000 daily tons of high brightness quality pulps. We welcome the opportunity to work with you.

IMPCO

IMPROVED MACHINERY INC.

NASHUA, NEW HAMPSHIRE

Sherbrooke Machineries Limited manufacture similar equipment in Canada

CB&I tanks like these boost pulp and paper mill production

Foam and liquor tanks fabricated and erected by CB&I for the Mead Corporation, Chillicothe, Ohio.

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City
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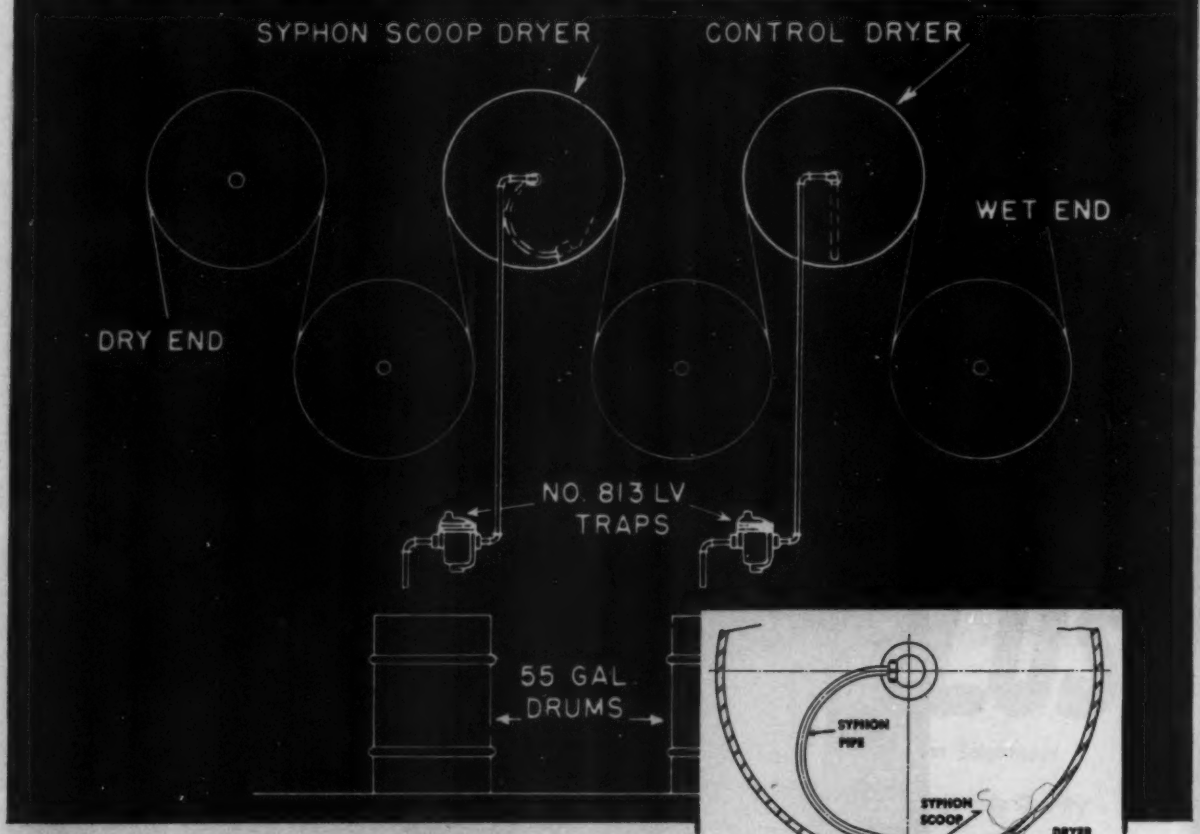
Plants in
BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

. . . talk about "bottlenecks in industry"—nothing can hold back production like a tank or steel plate structure that you *need but don't have.* The right tank or structure in the right place can often touch off a chain reaction of efficiency.

As the man responsible, perhaps you can create new efficiency at your mill and improve your competitive position by the installation of a new tank in a key spot, or by the installation of new digesters or other types of Chicago Bridge & Iron Company steel plate work.

Write our nearest office for complete information, estimates or quotations.

ARMSTRONG SYPHON-SCOOP GIVES BETTER, MORE COMPLETE DRAINAGE OF REVOLVING DRYERS

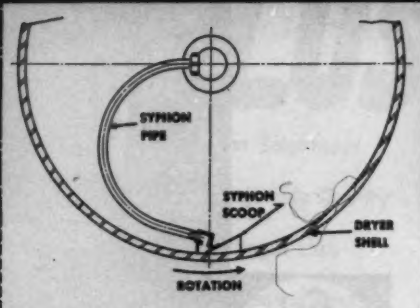


Less horsepower, greater efficiency, lower maintenance are the benefits derived

The Armstrong Syphon-Scoop is a combination of the two major methods employed today of removing condensate from revolving dryers—the revolving scoop and the syphon. By combining these two methods into one, Armstrong has successfully eliminated the disadvantages of each and captured all the advantages. Above rimming speeds only a 1/16″ rim of condensate can remain in the dryer. Below rimming speeds, the generous scoop removes condensate *just as fast as it forms.*

As a result, less horsepower is required to operate the dryers, heat transfer efficiency is improved and maintenance is reduced because there is less wear and tear on the Syphon-Scoop than on stationary syphon pipes. For complete details write:

ARMSTRONG MACHINE WORKS,
816 Hoffman Street, Three Rivers, Michigan



Test shows superiority of Armstrong Syphon-Scoop over stationary syphon.

TEST—To determine the advantage of an Armstrong Syphon-Scoop as compared to a stationary syphon for draining 60″ diameter 168″ face dryers operating at 720 FPM drying kraft paper, a test set-up was made as diagramed. Condensing rate of the two dryers was approximately the same.

RESULTS—In a 3½ hour period the trap draining the Syphon-Scoop Dryer discharged 85 gallons (700 lbs) more condensate than did the trap draining the Control Dryer.

CONCLUSION—1—By keeping dryer practically empty, less horsepower is required to drive the machine.

2—By preventing any build-up of condensate in the dryer, there is no surging of condensate with adverse effect on life of syphons. On this machine where the tests were made, average life of stationary syphon pipes is only one year.

PM15

GUARANTEED

ARMSTRONG SYPHON-SCOOP

Here is the "INSIDE INFORMATION" on FALK ALL-STEEL Shaft Mounted Drives

Take a careful look inside the Falk all-steel Shaft Mounted Drive, and you will know why this newest member of the famous Falk family is ideal for applications where direct mounting on the driven shaft is desirable. It is the only drive in its field with all these superior "In-built" factors:—

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

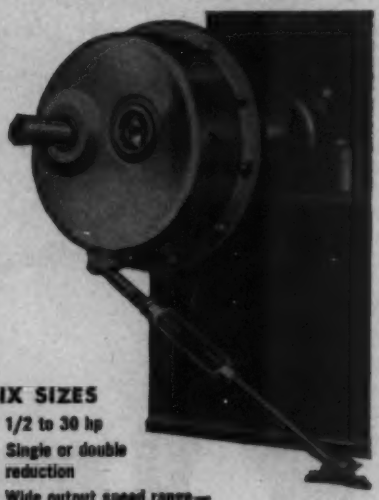
5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

Write to Department 247 for engineering bulletin, including selection and dimension details.

EFFICIENT SPEED REDUCTION IN LIMITED SPACE



SIX SIZES

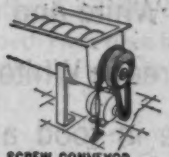
- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm

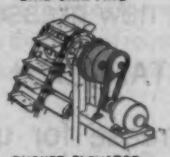
Expressly designed for topflight performance on installations requiring considerable speed reduction in limited space, the all-steel FALK Shaft Mounted Drive has quickly won acceptance throughout industry. This sturdy, compact, versatile reducing unit is an ingenious variation of the highly successful FALK Motoreducer design, pacemaker in its field for more than 20 years. Here, the time-proved design is adapted for mounting directly on the shaft to be driven, using V-belt connection to motor. Investigate now!

A FEW TYPICAL APPLICATIONS

APRON FEEDER

LINE SHAFTING


SCREW CONVEYOR


BUCKET ELEVATOR

BELT CONVEYOR

GRAVEL CLASSIFIER

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

Here's another
new lubrication
improvement
from Standard Oil

NEW STANOLITH GREASE WHITE

A new grease! White and clean in appearance, STANOLITH Grease White is the perfect grease for use in food and beverage plants.

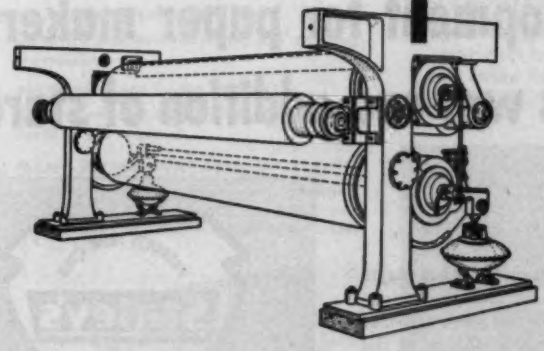
Specially recommended for bakeries, breweries, candy factories, canning and cereal plants, chemical processing plants, dairies, distilleries, meat processors — all industries where clean, sanitary operating conditions are at a premium.

● STANOLITH Grease White is a new high quality, multi-purpose lithium soap grease with a clean, white color. It assures you of unmatched lubricating cleanliness *plus* unmatched lubricating efficiency.

In addition to the high-temperature and water resistant properties, characteristic of most lithium greases, STANOLITH Grease White has superior mechanical and chemical stability. It provides a water-resistant lubricating film that gives this remarkable grease extended multi-purpose usage in a wide variety of applications. Easily handled in all usual types of grease-dispensing equipment, it is safe, easy-to-use, clean. Call your nearby Standard Oil lubrication specialist for full details on new STANOLITH Grease White.

STANDARD OIL COMPANY *(Indiana)*

STANDARD



for high finish grades

Progress in board machine design dictates the inclusion of a smooth press when high finishes are required. The Black-Clawson smooth press fully satisfies that requirement.

An all-inclusive design. Every sound and effective feature present. Installation in any dryer section.

Construction details on request.

BLACK-CLAWSON

THE BLACK-CLAWSON CO. • HAMILTON, OHIO

Staley's

® BETTER PRODUCTS FOR BETTER PAPERS

STALEY'S RESEARCH BUILDS PROGRESS

In modern, well-equipped laboratories, Staley research technicians constantly search for new products and better applications for old ones. The results of Staley's research are products and methods that help you make finer papers at lower cost.

Now! A new Staley development for paper makers— a jet cooker for continuous wet end addition of starch!

New Staley Jet System revolutionizes starch preparation and application . . . cuts costs

NOW! After years of development and successful field testing, another major technological advance from Staley's . . . The Staley Jet System. This revolutionary apparatus provides for the first time *positive control over the full range of cooked starch properties and characteristics,* along with *continuous automatic addition* at the wet end.

The Staley Jet System adjusts to suit your purpose over the entire range of properties to the exact proper mixture. Set it . . . forget it! Starch is cooked and added at the wet end, *continuously* and *uniformly.* You save mixing time, reduce starch consumption, and improve functional quality of starch suspensions. See about the increased efficiency and lower costs the new Staley Jet System will bring to your plant now! Your Staley technical paper representative will furnish complete information at your request, or write for descriptive brochure.

A. E. Staley Manufacturing Company, Decatur, Illinois

BRANCH OFFICES: ATLANTA • BOSTON • CHICAGO • CLEVELAND • KANSAS CITY • NEW YORK • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

PRODUCTS FROM CORN Staley's AND SOYBEANS

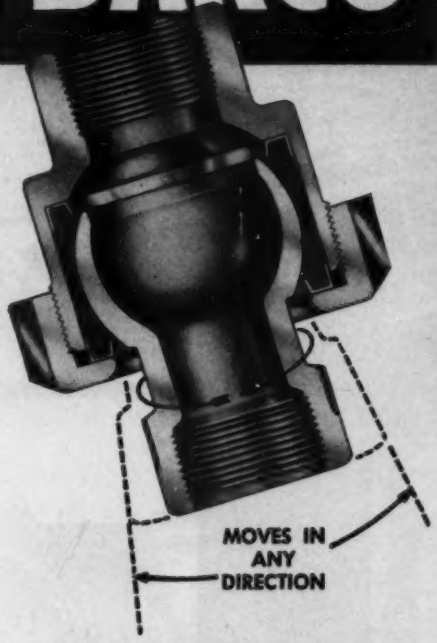
QUALITY PAPER PRODUCTS

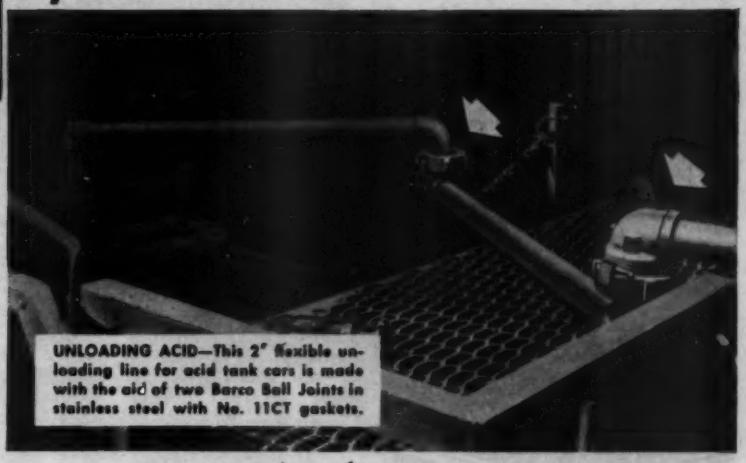
Coating Starches and Dextrins

Beater Starches

Calender Starches

BARCO *Flexible* BALL JOINTS





UNLOADING ACID—This 2" flexible unloading line for acid tank cars is made with the aid of two Barco Ball Joints in stainless steel with No. 11CT gaskets.

... for handling

ACIDS • CAUSTIC SOLUTIONS BLEACH CHEMICALS

in Pulp and Paper Mills

Leading manufacturers of all kinds of chemicals used in pulp and paper mills recommend use of BARCO BALL JOINTS wherever you must provide for *flexibility* or *movement in piping.* Here's why:

Barco's *standard* malleable iron ball and casing offer good resistance to chemical action and corrosion. Where additional protection is desired, these parts can be supplied in stainless steel or virtually any alloy specified.

Barco's new No. 11CT gaskets are impervious to chemical action and maintain a tight seal without interfering with the easy turning action of the joint. No lubrication is required.

One Barco Ball Joint will do the work of two or more swivel joints because it *"moves in any direction."*

Barco Ball Joints can help you in many ways. Use them in your mill! Barco also makes revolving joints (for continuous higher speed rotation), swivel joints, and swing joints for other kinds of pipe movement. For complete information, write BARCO MANUFACTURING CO., 526D Hough St., Barrington, Illinois

1. **NO METAL-TO-METAL CONTACT BETWEEN MOVING PARTS.**
   An important Barco advantage where corrosive chemicals are present, either externally or internally.
2. **CHEMICALLY INERT GASKETS.**
   Barco offers a choice of seven types of gaskets including No. 11CT for corrosive service. No lubrication required.
3. **STAINLESS STEEL.**
   Also regularly furnished in Malleable Iron, Steel, Bronze, and Aluminum. Other special alloy joints to order.
4. **MAXIMUM FLEXIBILITY.**
   Up to 40° side flexibility with 360° rotating movement.
5. **PRESSURE SAFE! FIRE-PROOF!**
   Unequalled for SAFETY where flexible connections are required.
6. **MANY STYLES AVAILABLE.**
   Angle or straight; threaded or flanged connections. For pressures to 7,500 psi; temperatures to 1000° F. 15 different sizes. ¼" to 12".

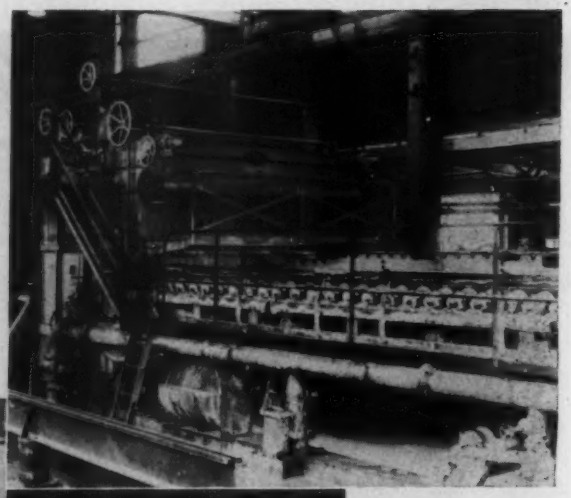
DIGESTER—4" Flanged Barco Malleable Iron Ball Joints with No. 11 gaskets give excellent service in connecting piping to slow revolving spherical digesters.

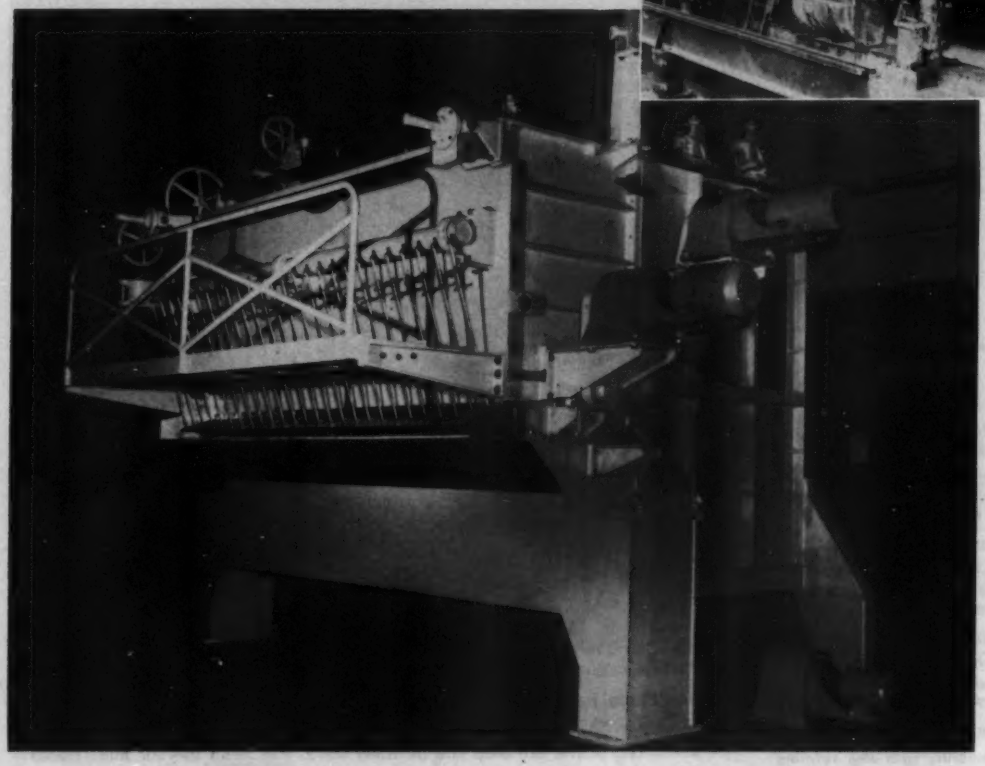
New No. 1 machine

Rebuild at

ST. REGIS PAPER CO.

Pensacola, Florida





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VALLEY

for detailed information write

VALLEY IRON WORKS CO. APPLETON, WISCONSIN

Canadian Representatives: Pulp & Paper Mill Accessories Ltd., P.O. Box 903, Station "O" Montreal 9, Quebec

"SAVINGS in operation and maintenance first year *more* than cost of four Yarway Digester Blow Valves"

THAT was the experience of a large Florida mill after they installed YARWAY Seatless Motor Operated Blow Valves on their digesters.

Clean, fast blows eliminated production delays. Expensive liquor loss from leaking valves ended. Remote control of motor operation reduced operating costs.

Continued satisfaction has resulted in installation of additional YARWAY Digester Valves for expanded plant facilities.

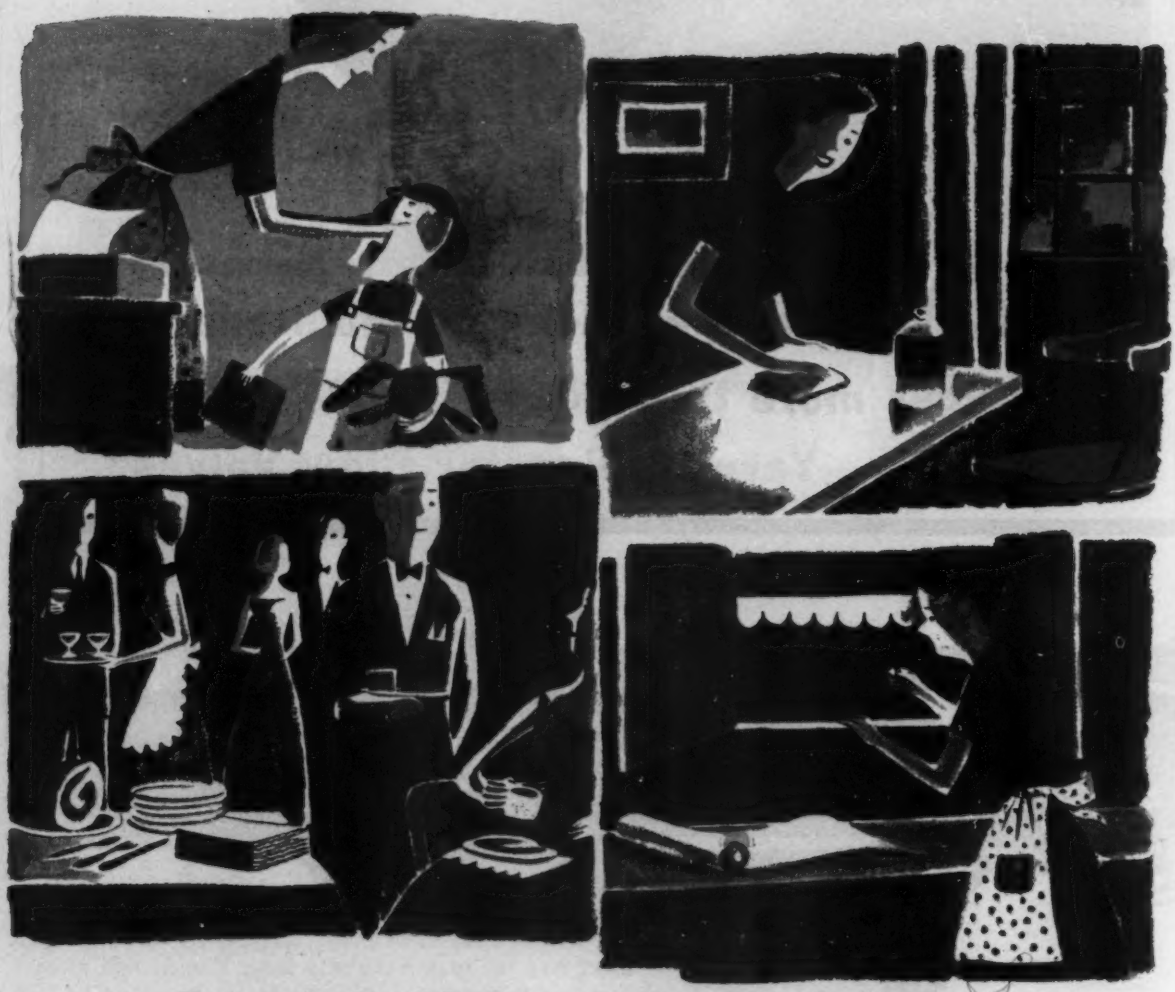
Such records are not unusual and new features like the YARWAY 17/4 PH stainless steel plunger and automatic lubricator, combined with improved operating control, make YARWAY Seatless Digester Blow Valves an even better buy today.

You may choose between hydraulic-cylinder or electric motor operated valves, all remotely controlled.

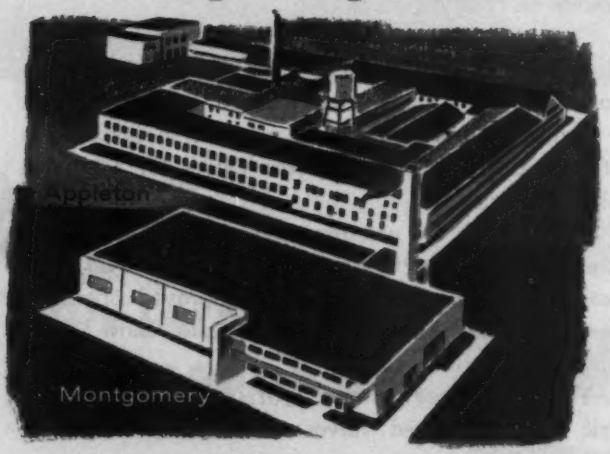
For the full story on Yarway Seatless Digester Blow Valves write for this free Bulletin B-440.

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 18, Pa.
BRANCH OFFICES IN PRINCIPAL CITIES

YARWAY digester blow valves



Paper helps Mother all through the house



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Happy the home where household papers do their countless and important chores. A tidier home, brighter and healthier too. From tissues for winter noses to gay colors for cupboard shelves—napkins to towels, food wraps to polishing cloths—Mother is really papering the house these days. Efficiently, economically, attractively.

And in at the start of household papers—in every field where paper goes to work... Fourdrinier wires. Appleton Wires. Good wires—by a 59-year test of industry-wide acceptance and use.

Appleton Wire Works, Inc.

The New York & Pennsylvania Company found that...

for complete process instrumentation

ONE SOURCE STANDS OUT!

Like other leading companies, the New York & Pennsylvania Company, makers of fine book and specialty papers, found that Fischer & Porter offered them integrated instrumentation and control systems — *all from a single source.*

Converting their Johnsonburg, Pa., mill from batch-type stock preparation to continuous automatic stock preparation called for five separate blending systems feeding five separate paper machines, plus a complete refiner control system — all integrated into one centralized control station. And to get the jump on competition, the N.Y. & Pa. Co. had F&P do a complete conversion all in one fell swoop!

Write for details on the F&P Ratographic* miniature pneumatic recorder-controller, offering 4-inch strip chart record.
*T.M., F&P Co.

From one source, the N.Y. & Pa. Company obtained the engineering experience and know-how to design and instrument the system, the specialized meters (e.g., Ratosleeve* stock meters) and valves (e.g., Ratogate* stock valves) and instruments (all of F&P design and manufacture) to control the processes, and the complete panel fabrication right down to the last graphic symbol.

Because the complete package was obtained from one team, responsibility for delivery and performance was not divided, the cost far less. Perfectly matched instruments, rather than non-mating components, meant complete satisfaction for this customer.

Write today and tell F&P your needs — the answers will be yours quickly, without obligation. Compare and you must agree — F&P *is the one source that stands out.*

complete process instrumentation

FISCHER & PORTER CO.

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research that serves . . . and saves!

Behind the far-flung field service of Layne Associate Companies is a Research Division that has many achievements to its credit. And most of these achievements are practical, usable, workable achievements that have resulted in better drilling methods . . . better equipment . . . better applications . . . better exploration practice . . . in short a betterment of all of the many phases of water development.

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LAYNE & BOWLER, INC.

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Layne Associate Companies throughout the World

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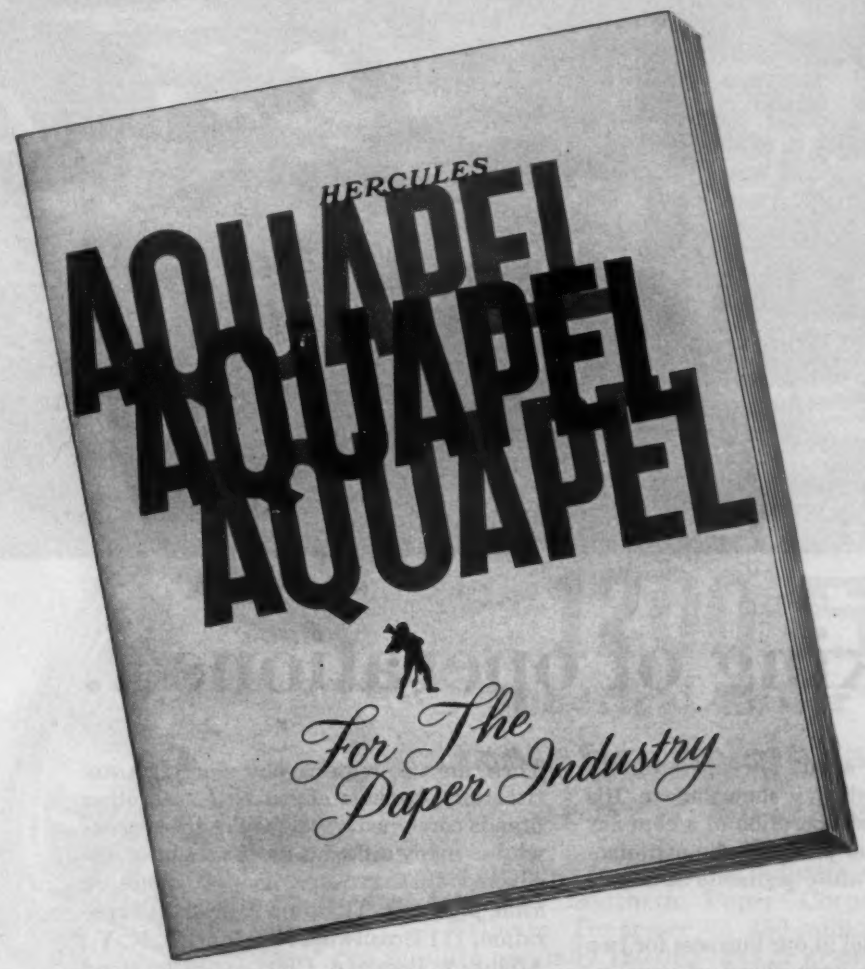
Here's the answer to the questions you'll be asking about AQUAPEL



This newly published booklet contains the answers to the questions you'll be asking about Aquapel*—a unique non-rosin, non-wax size for paper and board that is the latest addition to the Hercules family of papermaking chemicals.

Primarily intended for surface application as an emulsion, Aquapel 380 is not a "surface size" in the usual sense because it replaces rather than supplements beater sizing with rosin and alum.

Two to six pounds of Aquapel per ton of fiber will provide a very hard sizing without rosin or alum over a wide pH range. Aquapel gives excellent resistance to alkalies, lactic acid, and other strong chemicals, making paper and board suitable for many diversified end uses.

For technical information on Aquapel and details on availability, write Hercules.

Paper Makers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
961 King St., Wilmington 99, Del.

*HERCULES TRADEMARK

PPEB-1

speaking of operations...

Let us tell you about *our* operation—a small section of which is shown above. It's the world's largest operation of a complex inorganic chemical process—the manufacture of TITANOX white pigments at Sayreville, N. J.

Bigness is essential in our business for two reasons. First, to keep ahead of your increasing demand for titanium dioxide white pigments in new and established uses. Second, to maintain your preference for TITANOX white pigments—a preference created by TITANOX quality, service and uniformity.

These are two reasons why more TITANOX titanium pigments are sold than all other brands combined. And they're the reasons why so many different industries have discovered that TITANOX is *first choice in white pigments*. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

over 1200 SKF Spherical Roller Bearings on these two Beloit Paper Machines at new Bowaters Mill

Biggest news in the paper industry these days is the new Bowaters Southern Paper Corporation mill at Calhoun, Tennessee—a $60-million project which can produce annually 130,000 tons of newsprint and 55,000 tons of semi-bleached or unbleached Kraft pulp.

Contributing to the dependability of the Beloit Iron Works paper machines—and providing more capacity and longer life than any other spherical design available—are 1,278 SKF Spherical Roller Bearings.

When you are *designing* paper mill machinery, think first of SKF for help on anti-friction problems.

SKF INDUSTRIES, INC., PHILA. 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT® *bearings.* 7911

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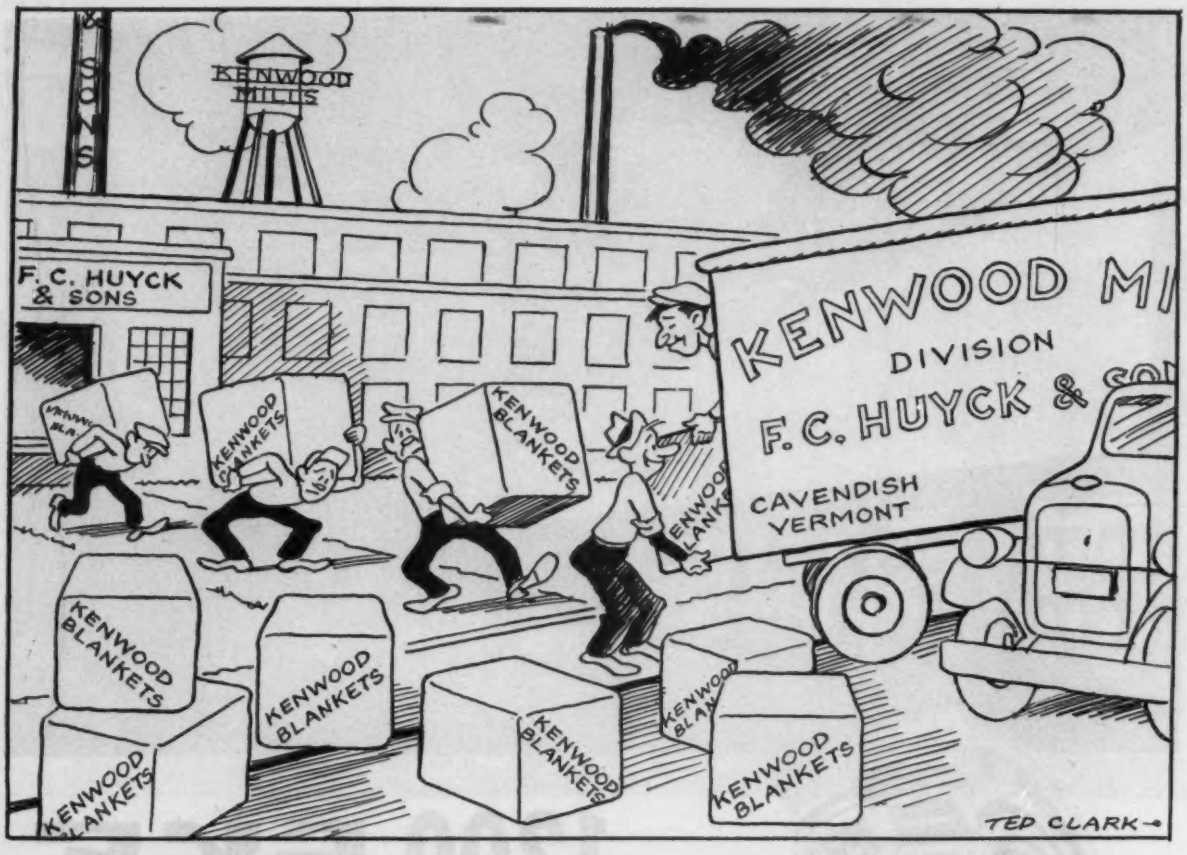
BALL AND ROLLER BEARINGS



What's *new* about Huyck felts?

CHAPTER I: MOVING DAY

You know the emptiness you'd feel seeing an old friend leave your neighborhood. We felt that way, too, the day we moved our entire Kenwood blanket operation to Cavendish, Vt.

Trouble was, we had no alternative. Space was needed for increasing production capacity to meet the growing demands of paper-makers for new Huyck felts—and for additional equipment now being used in the development of new techniques in felt making.

Also, we knew that many advantages would accrue to papermakers—and to us—by going all-out for specialization in manufacture . . . devoting *all* of our facilities and knowhow to making felts, and felts alone, at Rensselaer, N. Y.

• •

This is but a part of the continuing story of what Huyck is doing to help you produce better paper at lower felt cost per ton.

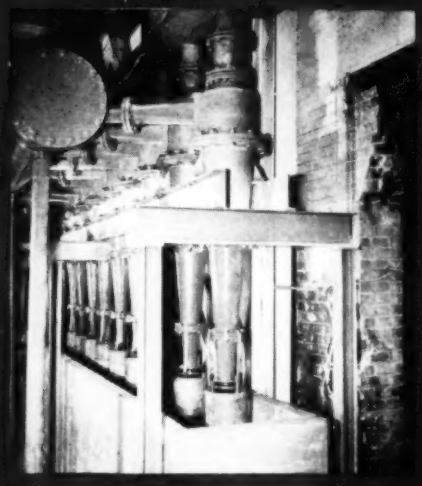
Just released — Huyck Felt Bulletin (Vol. II, No. 7)—*Factors Influencing Water Removal in a Plain Press.*
Write for your copy today.

NEW!
HUYCK FELTS

FIRST IN QUALITY . . . FIRST IN SERVICE

F. C. HUYCK & SONS • Rensselaer, New York
Established 1870

KENWOOD TEXTILE PRODUCTS



Bauer

BAUER CLEANERS

remove more than soil and sand

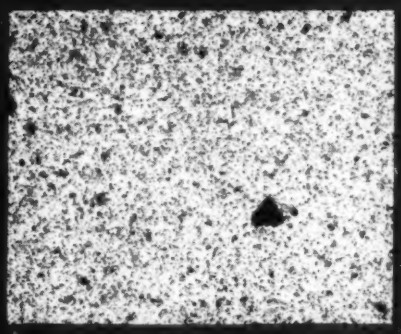
Since particles of high specific gravity naturally settle from water suspensions, their removal from pulp slurry is easy. But Bauer Cleaners recognize other kinds of dirt in pulp — particles of different shape than fibers.

So the cleaners from Bauer Cleaners are not only soil and sand — but also pieces of rock, stones, cinders and rust — heavy debris.

You can see what we mean [illegible] from [illegible] cleaner rejects. We'll be glad to send you a [illegible] of samples, as well as sheets made from accepted stock. The difference is amazing.

Photograph shows a hand dug stone from Bauer cleaner [illegible] rejects. Even [illegible] sandpaper!

Ask to see our rejects. The coupon can be used.



THE BAUER BROS. CO.

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Show me sample sheets made from Bauer Cleaner rejects and accepted stock.

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(Individual and Title)

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(Company)

_____
(Street Address or Box)

_____
(City, Zone, State)

HOOPERWOOD

style 200

CLIPPER SEAMS

cut

DRYER FELT

costs

Stronger than conventional clipper seams—particularly effective on high speed machines, or machines with small diameter felt rolls. Ask for sample.

WM. E. HOOPER & SONS CO.

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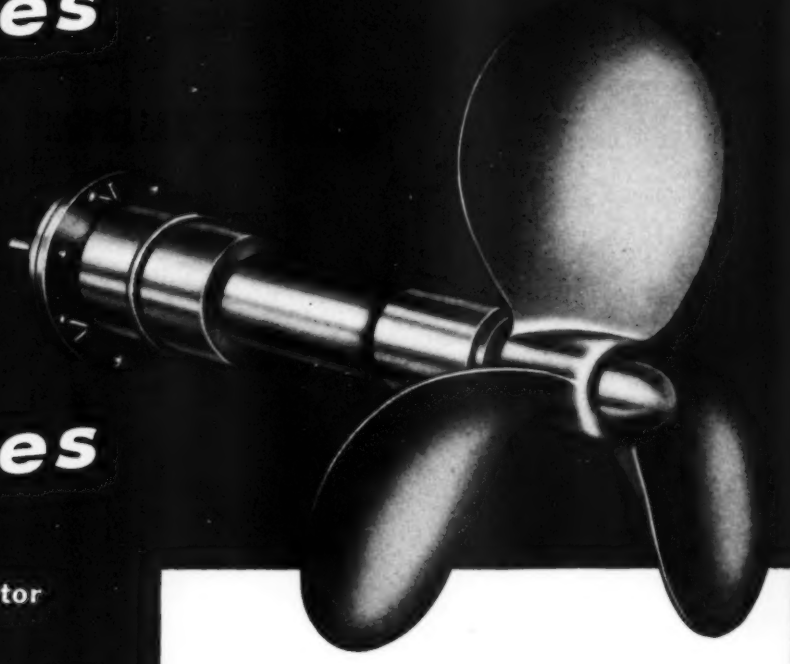
HOOPERWOOD MILLS — Woodberry, Baltimore 11

COTTON and ASBESTOS DRYER FELTS

COTTON and NYLON CARRIER ROPE

E.D. Jones



E.D. Jones

Fixed Pitch
Propeller Agitator

E.D. Jones

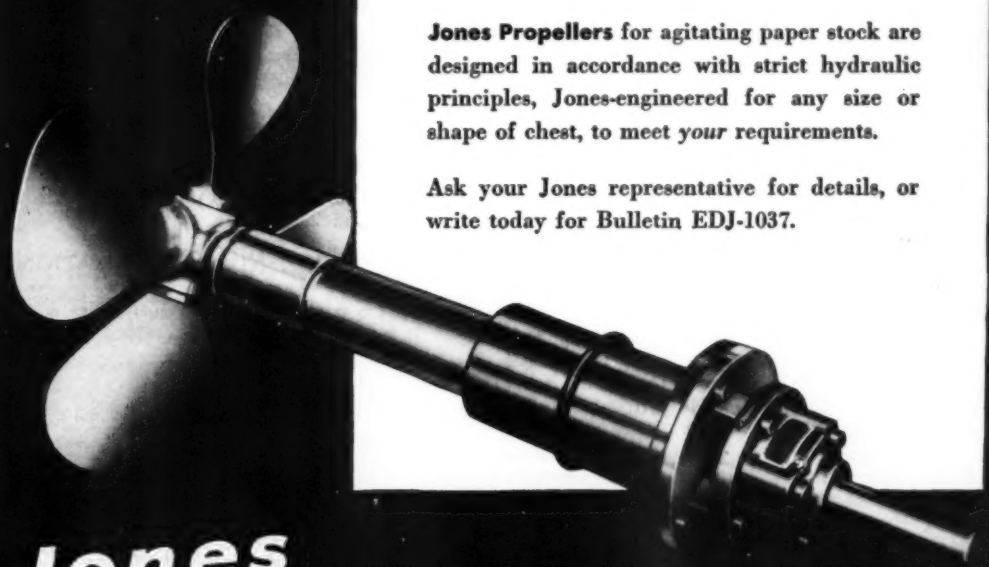
Variable Pitch
Propeller Agitator

Are you plagued by Jordan, Beater or Paper Machine problems caused by inadequate agitation . . . ?

Need better mixing for color blending or to prevent stock stratification . . . ?

Jones Propellers for agitating paper stock are designed in accordance with strict hydraulic principles, Jones-engineered for any size or shape of chest, to meet *your* requirements.

Ask your Jones representative for details, or write today for Bulletin EDJ-1037.



E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

In Canada: The Alexander Fleck Limited, Ottawa

DOUBLE SAFEGUARD

For this Bagley and Sewall Paper Machine

BOWSER LUBRICATION SYSTEM EQUIPPED WITH ROSS EXCHANGER

Reported to be "one of the most modern paper machines in the world today", this Bagley & Sewall machine has a wire width of 228" and is designed for a production of 400 tons of paper per day at a speed of 2200 feet per minute.

To keep production at a peak . . . to avoid down time . . . safe, dependable lubrication must be assured. *And here's how it is*: The Bowser Lubrication System serving this modern paper maker is Ross Exchanger equipped. Oil flowing to bearings of dryer rolls and calender stacks is properly cooled at all times.

In summing up the advantages of Ross Exchangers, Bowser, Inc. says, "Satisfactory performance plus satisfactory relationship with Kewanee-Ross over a considerable period of years, plus good service . . . account for our continued use."

For similar reasons, manufacturers of numerous types and makes of paper mill equipment regularly install Ross Exchangers to cool oil, water, hydraulic fluid and air.

Because they are pre-engineered and fully standardized, Ross Exchangers can be delivered to meet your needs without delay. For detailed information, request Bulletins 1.1K5 and 2.1K1.

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DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

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Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

Here's how you can profit
with Du Pont Peroxides and Bleaching Processes

. . . in bleaching sulfate pulp

Peroxide bleaching with the Du Pont process can give you a better-selling combination of brightness and strength for kraft. You can bleach sulfate pulps to high brightness with good strength characteristics . . . or normal brightness with premium strength.

Your yield stays high, since there is little or no loss due to bleaching. And the bleached pulp is highly uniform . . . variations that occur in multi-stage bleaching are smoothed out by the process.

SEND FOR THIS BOOKLET, "Peroxide Bleaching of Sulfate Pulp." It describes the Du Pont process in detail . . . includes information on recommended bleaching formulas, chemical control tests, handling and storage of peroxides. Mail coupon for your copy.

. . . in bleaching groundwood

You can bleach low-cost groundwood for use in higher-quality papers with the Du Pont Peroxide Bleaching Process. This economical process preserves all the desirable features of groundwood while increasing pulp brightness. Printing properties are improved and finished paper has a smoother, more velvety hand.

You'll save with exceptionally high fiber yields . . . low waste disposal . . . improved opacity in same weight sheet . . . more rapid drainage during paper manufacture.

SEND FOR THIS BOOKLET on peroxide bleaching of groundwood. Formulations, procedures and equipment for the Du Pont process are described, plus control tests for bleaching solutions. Mail coupon for your copy.

. . . in waste paper recovery

You can produce high-grade pulp from low-grade waste paper with the Du Pont Peroxide Process. Your pulping time is cut . . . your yields improved. Recovered pulp is bright, strong, stable, and highly uniform—regardless of groundwood content.

Lower pulping temperature means reduced steam costs . . . consumption of hypochlorite can be cut as much as 25%. And the stock you produce has better color stability.

SEND FOR THIS BULLETIN—on peroxides in the recovery of waste paper. It's offered by Du Pont, pioneer producer of peroxides, and gives full information on bleaching pulp and recovered stock. Specific suggestions are given pertaining to the recovery of magazine and newspaper stock. Mail coupon for your copy.

Du Pont peroxides are available for prompt delivery from conveniently located manufacturing plants. Du Pont's modern plants and facilities assure you a dependable supply of top-quality peroxide for your bleaching needs.

MAIL COUPON TODAY

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PEROXIDES
FOR WOOD PULP BLEACHING

"Albone".....**Hydrogen Peroxide**
"Solozone".....**Sodium Peroxide**

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E. I. du Pont de Nemours & Co. (Inc.) PI-3
Electrochemicals Dept., Wilmington 98, Del.

Please send me literature on Du Pont Peroxide Bleaching Processes: (*Check applications*)

☐ Sulfate Pulp ☐ Groundwood ☐ Waste Paper Recovery

Name _____

Firm _____ *Position* _____

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City _____ *State* _____

A Sample Here Doesn't Tell the Story HERE

A sample taken at the beginning or end of a roll doesn't guarantee consistent quality You don't know what the condition is in other parts. As a result, you may often return a roll to the beater when 98% of it is within tolerance limits. Further, even if an out-of-caliper trend can be detected, it takes a lot of costly guessing to get back on spec.

In contrast, Hurletron Automatic Caliper and Weight Controls *automatically* measure, record and control every sheet-inch at the wet end. They also provide a permanent record of board quality at the dry end. A trouble light signals when sheet drift occurs. Other sentinel lights warn when slides, crushes, drop-offs, plugged gates, plugged screens or other factors threaten loss of the sheet.

AS A RESULT, YOU GET...

- a consistently uniform sheet from start to finish
- better board quality
- faster specs for new runs
- less broke
- a 2 to 3 point stock saving
- increased production
- decreased labor costs

Hurletron Automatic Caliper and Weight Controls have been performance-tested, time-proved in many of the country's leading mills. They're built to give years of quality producing, cost cutting service. Let us show you how this modern equipment can do the same kind of job in your mill. Write today . . . no obligation.

HURLETRON Automatic CALIPER and WEIGHT CONTROL

ASK FOR BULLETIN 211.

It contains full details, charts, diagrams and practical information about Hurletron Controls.

ELECTRIC EYE EQUIPMENT COMPANY
1936 FAIRCHILD STREET • DANVILLE, ILLINOIS

Manufacturers of Hurletron automatic controls for Color Register; Center Line and Side Web Guide; Cut-off and Back-up; Moisture.

CURRENT COMMENTS

A new era . . . a possible new record . . . and the industry's stand

1954-1955 is ushering in a new era in the American paper industry. Production in 1954 broke all previous records. In 1955 there will be much new capacity, new faces throughout the major units of the industry, consolidations of old units—all of which means a new look. Consolidations within the industry, which were such an important factor in the 1954 period, are continuing, with operations in the older merged organizations being perceptibly crystallized.

When the 1954 Paper Week was being held, the optimists prophesied that the industry could feel happy if 1954 production were not more than 7 per cent under the previous high record of 1953. As the year progressed it became evident that optimists had actually been pessimists, and now that final figures are available it is found that the 1954 production of paper and paperboard was more than one-half of 1 per cent above even the previous top figure.

Production in 1954 reached a total of 26,613,000 tons, or roughly 100,000 tons over 1953. This rate was achieved in the face of a sharp drop in paperboard production, which at one time was as much as 4 per cent below 1953 totals. Production of tissue papers led the increase by adding 4 per cent to the 1953 output. Total production was about equally divided in tonnage between paper and paperboard.

The opening weeks of 1955 indicate a possible new record for the coming year. There will be new capacity in operation before the end of the year approximating 200,000 tons, and production capacity by 1960 is expected to be upward of 30,000,000 tons.

A new generation

A new generation is coming into its own in the operating, management and sales segments of the industry. Glancing over company announcements for many weeks past, it has been notable that recognition is being granted everywhere to the up and coming young men, who are taking the places of older executives.

The consolidation program which became such an important factor in the past several months is continuing. This trend has been accompanied by a shift in new enterprise from the northern United States and Canada to larger operations in the southern pine belt and also to the Pacific Coast. Most notable in the last few years has been the development of new processes which have enabled the industry to expand in the newsprint field with new mills in the pine belt. This trend is apparently growing. Especially is it noticeable that such developments as Coosa River and Bowater have been made possible by investments of newspaper publishers in the mills on which they depend for their raw material. This eliminates the sales hazard to the producers. A most notable phase of this development is the decision of International to invest $20,000,000 in a southern newsprint mill. International's present newsprint production is concentrated in Canada, under Canadian International; so, the new southern project has an important bearing on the future.

Improved markets and sales

As of the first weeks of 1955, all evidence points toward improved market and sales conditions. Price increases have been registered in various grades, and there is no diminution in demand. A notable feature has been the changed trend in pulp. Today, United States pulp is being exported, as compared with some past years when the industry was so largely reliant on Scandinavian pulp.

The paper industry during the past month has made a vigorous presentation of its position to the authorities at Washington. The Pulp, Paper and Paperboard Industry Council made its attitude clear toward many phases of its contacts with government at a conference with officials of the Business and Defense Services Administration of the Department of Commerce.

Strong protest was made against the use of United States government funds to finance the development of pulp and paper industries in foreign lands where such investments have been investigated and found to be uneconomic. The Paper Industry Council took the positive position that any investment in foreign mills should be measured by the same yardstick that American business uses in deciding upon investment in new enterprises.

The question of the industry's attitude on reciprocal trade argreements was plainly expounded. It was pointed out that the rates of duty on paper have been reduced to the danger point by trade agreements already negotiated. It was stated that the industry adheres generally to the policy outlined in the report of the so-called Randall commission, but asked that in negotiating such agreements they should be strictly on a two-way basis.

The Ways and Means Committee of the House of Representatives has recognized this demand by amendment to the pending Reciprocal Trade Agreement bill. The original bill would permit the President to arbitrarily and without compensatory action reduce the rate of duty on any commodity now being imported into this country in minor quantities if at all. As accepted by the Committee and recommended to Congress, the bill required that any such grants be on a reciprocal basis.

Financial Reports

Paper mill securities have shared in the advances in the average prices of industrial securities, reaching an overall new high record since the first of the year.

Net Incomes

Celotex Corp.—Net income for the fiscal year ended October 31 was $3,202,649, as against $3,024,844 for the previous fiscal year.

Chesapeake Corp. of Virginia—Net income for 52 weeks ended January 2 was

Current comments . . .

$2,842,518, as compared to $2,446,490 for the comparable previous fiscal year.

Container Corp. of America—Net income in 1954 was $13,604,232, as against $10,127,948 in 1953.

Kalamazoo Vegetable Parchment Co.—Net income for the three months ended December 31 was $543,889, as against $703,305 a year ago.

Keyes Fibre Co.—Net income for the 12 months ended December 31 was $1,447,010, as against $1,000,396 for the previous year.

Mead Corp.—Net income for the year 1954 was $5,812,000, as against $5,424,488 in 1953.

Minnesota & Ontario Paper Co.—Net income in 1954 was $6,000,000, as against $5,687,000 in 1953.

Rayonier Inc.—Net income for the year ended December 31 was $11,860,000, as against $10,637,166 for the previous year.

Paper mill corporate changes

Coconino Pulp & Paper Co. Inc. of Flagstaff, Ariz., has been acquired by Hewitt S. West of New York, N. Y., who plans expansion of its pulp making facilities.

Continental-Diamond Fibre Co. may become a subsidiary of the Budd Co. of Philadelphia as a part of the latter firm's diversification program. Continental stockholders will be offered share-for-share in Budd for their 450,000 outstanding shares.

W. C. Hamilton & Sons Inc. has made some 30,000 shares available to the public at $25 par. The stock holding is being distributed by a banking firm from the estate of a deceased member of the Hamilton company.

Stock and Bond Quotations

Closing Prices	Feb. 10, 1955	Jan. 10, 1955
New York Stock Exchange — Stocks		
A.P.W.	5¼	5¾
Celotex	29⅞	29
Same Pref	19½	*19-19¼
Certain-Teed	27⅛	27⅛
Champion P & F	53¾	53¾
Same Pref	*107½-109	*106-106⅝
Chesapeake Corp.	45⅝	*47½-48½
Container Corp.	65¼	63⅞
Same Pref	*108¼-108¾	105½
Continental-Diamond	17	14⅝
Crown Zellerbach	60¼	59½
Same Pref	*104½-105¼	104¾
Dixie Cup	54½	54
Eastern Corp.	23½	23⅜
Robert Gair	30	30¼
Gaylord Container	34⅞	35¼
Great Northern	*81-83	75¾
Hammermill	25⅜	22⅞
International	90½	85¼
Same Pref	104½	*106-108½
Kimberly-Clark	41½	38⅞
Same Pref	*163-167	*152-156
MacAndrews & Forbes	50¼	51½
Marathon	29	29
Masonite	30	27⅞
Mead Corp.	55⅜	55¼
Same Pref	*102½-102¾	103¼
Same Sec. Pref.	*61-64	*62-62¼
National Container	15⅛	15⅝
Same Pref.	26½	26⅜
Rayonier, Inc	63¼	61⅛
Same Pref.	39⅞	39
Scott Paper	60¼	59½
Same $3.40 Pref.	*95½-97½	96
Same $4.00 Pref.	*105-107	*104-106
St. Regis	38	40¼
Same Pref.	*103-104	103¼
Sutherland Paper	52	48
Union Bag & Paper	74½	70⅜
United B & C	*18⅝-18⅝	18¼
United Wall Paper	2½	3
Same Pref.	*16⅜-18	*18½-20⅞
U. S. Gypsum	230½	223½
Same Pref.	181½	180½
West Virginia	40	39¾
Same Pref.	108	108
New York Stock Exchange — Bonds		
Celotex 3¾%	....	100¼
Champion P & F	....	101
Mead Corp. 2%	....	99½
American Stock Exchange — Stocks		
American Writing	20	16⅝
Brown Company Common	16¾	15⅝
Same $5 Pref.	116	111½
Puget Sound	50	50

* Closing Bid and Asked Prices.

FREE LAYOUT SERVICE for all storage needs

Trained Equipto engineers stand ready to give you the benefit of vast experience in laying out storage facilities. This valuable service will give you a quick, accurate idea of the number and types of units you will need . . . will assure maximum use of every inch of floor space . . . will increase working efficiency and save man-hours because of expert arrangement of units

Equipto steel shelving features an exclusive steel stud that eliminates nuts, bolts, and tools . . . assures 60% faster assembly, instant shifting of shelves on 1½" centers without moving adjacent units, greater shelf capacity. So if you plan to build, modify, or expand your storage facilities, take advantage of Equipto's free layout service. Ask our engineer to call, or write for catalog on complete line.

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Division of Aurora Equipment Co.
606 Prairie Ave., Aurora, Illinois
Steel Shelving . . . Parts Bins . . . Drawer Units

Have you recently re-examined the profit potential

in COLORED LINES?

Running colored specialty lines need not introduce complications in your mill operations. With proper formulas and operating methods, colored lines are now easy to handle in the mill. And they can add unexpected income compared to the cost of coloring involved.

National Technical Service has helped many mills to produce colored lines efficiently and economically. Our paper technicians can provide low-cost formulas, stock compositions as well as in-the-mill operating help to get you started.

These services supplement our dependable delivery of the dyes you need from nearby warehouse stocks. They make it easy for you to add color lines now.

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ALLIED CHEMICAL & DYE CORPORATION
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TEST-PROVE *for yourself*

the sizing ability of versatile

KELGIN

products

obtain smooth, high gloss, mottle free printing ---- at reduced ink costs with

KELGIN / KELGIN LV / KELGIN XL

When applied on either calender stack or size press as a .75% — 3.5% solution, the following advantages may be expected:

• Smooth, high-density finish • Reduced wax penetration • Improved surface wax film • Greater brightness when waxed • Improved varnish holdout.

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POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

. . . THE COMPLETE QUALITY LINE . . . POWELL VALVES . . . THE COMPLETE QUALITY LINE . . .

FIG. 2192—Large Swing Check Valve for 200 Pounds W.O.G.

POWELL NI-RESIST VALVES

FIG. 2194—Gate Valve for 225 Pounds W.O.G.

FIG. 2193—1-Piece Yoke Gate Valve for 200 Pounds W.O.G.

FIG. 2193—2-Piece Yoke Gate Valve for 200 Pounds W.O.G.

POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

. . . THE COMPLETE QUALITY LINE . . . POWELL VALVES . . . THE COMPLETE QUALITY LINE . . .

Powell Ni-Resist* Valves have far greater corrosion, erosion and heat resistance than ordinary cast iron. Similar to gray iron, and resembling austenitic stainless steel, no other cast metal offers such a unique combination of useful properties. Ni-Resist Valves are especially adapted for pulp and paper mill liquors, alkalies and sludges, caustic soda, and wherever high nickel iron alloy valves are required.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about Powell Ni-Resist Valves—send for our *new* literature.

The Wm. Powell Company, Cincinnati 22, Ohio . . . . . 109th year

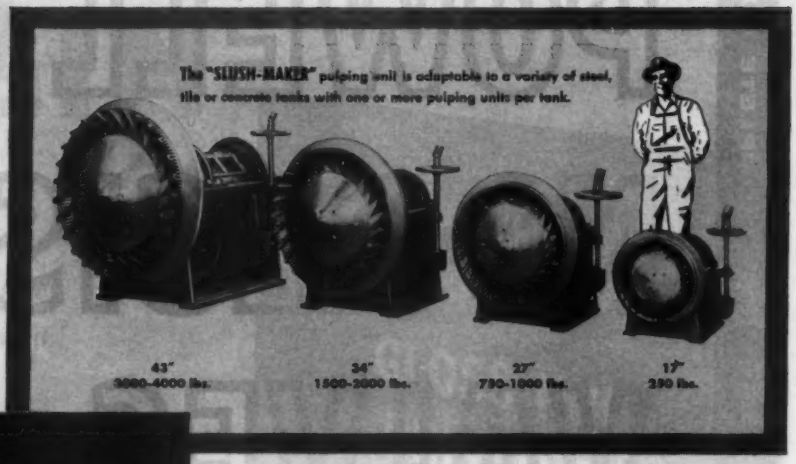
*Trademark of The International Nickel Co.

MORDEN SLUSH MAKER®

Patented

For Pulping

The Morden "Slush-Maker" can be used for either continuous or batch operation. Whichever method is used, there is a rapid and complete defibering.



These thumbnail sketches show some of the many tanks that can be designed to suit specific mill requirements.

Dry-End Continuous Broke Pulper with Single Rotor

Low-Headroom—Side-Discharge Tank

Special Single-Wall Cylindrical Tile Tank

Standard Double-Rotor Tank for Larger Capacity

Special Cylindrical-Top Steel Tank

Dry-End Continuous Broke Paper Pulper with Double Rotor

Standard Tank with Special Charging Port

Advantages

- **Full Bales or Slabs** can be charged by hand, lift truck or conveyor.
- **Dry-End Broke** can be handled continuously, directly under the paper machine.
- **Wet-Strength Papers** are readily reclaimed with the "Slush-Maker".
- **Rapid Pulping Action** permits greater production per day.
- **Operation** can be batch or continuous.
- **Vigorous Circulation** thoroughly mixes the colors and chemicals in less than a minute.
- **Completely Cleared Stock** reduces amount of beating and jordaning treatment required after pulping.
- **Tramp Materials** will not damage or bind the pulping unit.
- **Side-Mounted Pulping Unit** permits low-headroom applications, simple drives.

Northeastern States Representatives:
ORTON CORPORATION, Fitchburg, Massachusetts

Midwestern States Representatives:
DAN B. CHAPMAN, Appleton, Wisconsin

MORDEN
STOCK PREPARATION EQUIPMENT
MACHINES COMPANY

3420 S. W. MACADAM **PORTLAND, OREGON**

WELDCO ROLLS

. . . Help Produce Top-Quality Paper and Paperboard in new Virginia Paper Plant

The new Paper Machine shown above, produces paper of top-quality and uniformity, and represents the latest in modern paper-making equipment. Since great stress was placed on the newest, most efficient equipment for the company's modernization program, WELDCO Stainless Steel Roll Covers were chosen for the rolls in the Fourdrinier-type paper-making unit.

WELDCO-Covered Rolls are used in many other mills, too, because they offer maximum corrosion-resistance, reduce friction, have superior wettability, increase felt life, and lessen wear on fourdrinier wires. Their smooth, highly-polished surface won't chip, peel, crack or blister — gives many years of economical service, with very little maintenance.

WELDCO

Both new and old rolls can be covered with Stainless Steel, Monel, Nickel, Inconel, or other alloys, through the patented WELDCO "Pressure Welding" process. For your next machine—new or reconditioned—be sure to specify WELDCO Rolls. Ask your paper machinery builder about them, or contact us direct.

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3727 OAKWOOD AVENUE YOUNGSTOWN 9, OHIO

In the early stages of manufacture NIBROC TOWELS are more water than fiber. To make them into paper it is necessary to remove most of the water at the wet end of the paper machine.

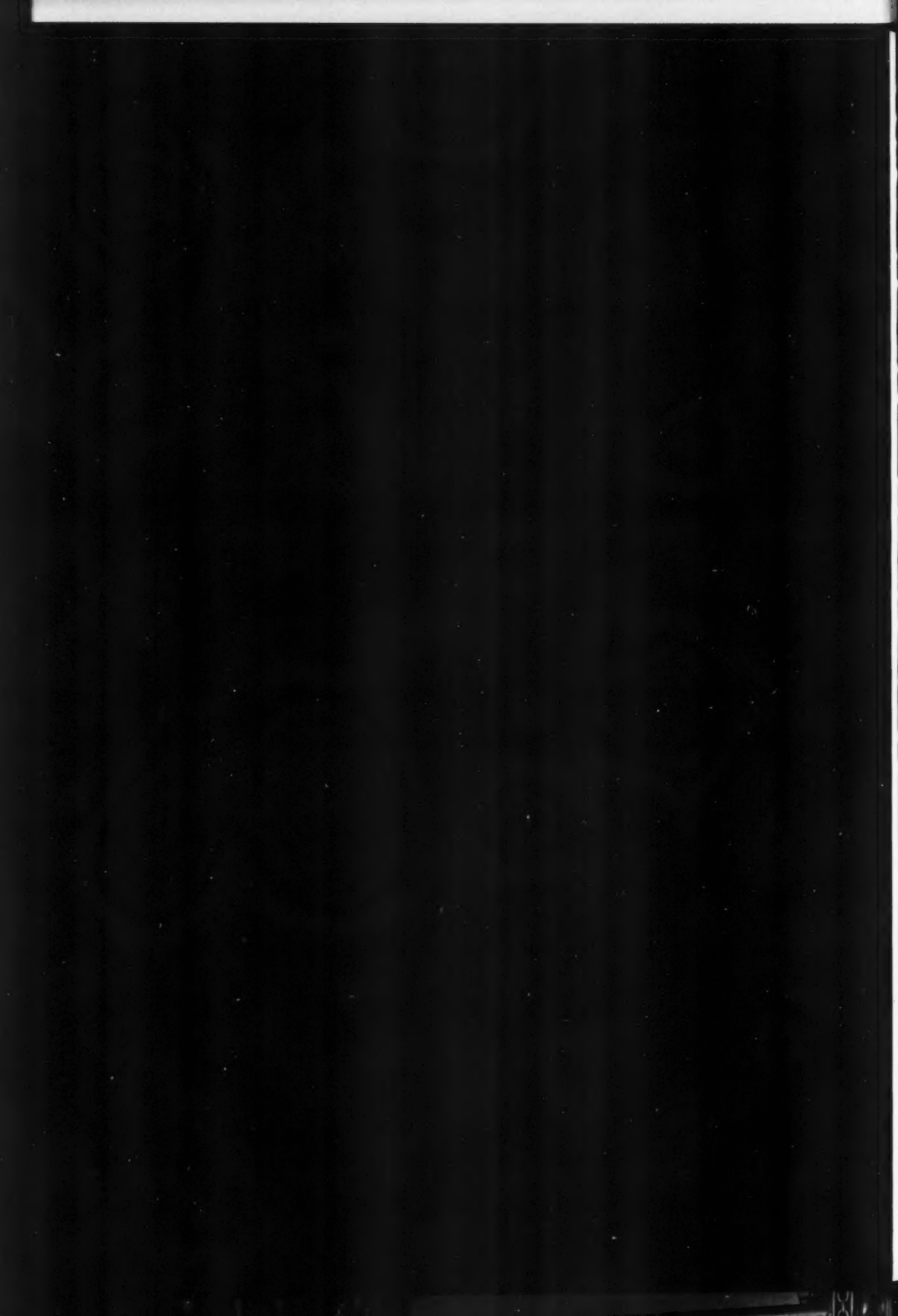
And because Hamilton Felts remove so much water in so little time, the chances are that the Nibroc Towels in your wash room were formed on HAMILTON FELTS.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO



For true whiteness . . . excellent opacity

In waxed-paper wraps UNITANE® 0-110

Titanium Dioxide

The point-of-purchase message is sure to attract the discriminating shopper when displayed against the whiteness of UNITANE® titanium dioxide. UNITANE 0-110 has the high water dispersibility and particle fineness to give excellent whiteness and opacity. A test run is sure to prove its operating ease and efficiency.

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AMERICAN Cyanamid COMPANY

PIGMENTS DIVISION

30 Rockefeller Plaza, New York 20, N. Y.

Branch Offices and Warehouses in Principal Cities

Through this door pass all knives for BOLTON FILLINGS

ALL BOLTON Jordan Plug and Shell knives go into our specially designed Circulating Oil Quench for Hardening and Tempering — then into this Precision Controlled, Recirculating Atmosphere, Gas Furnace.

HEAT TREATING at the Bolton plant is an exact science. Raw materials are carefully analyzed and controlled. Timing and critical temperatures are calculated for maximum, dependable knife hardness. Strategically placed thermocouples assure uniform heat throughout the furnace. Electrically controlled gauges and a red line continuous indicating graph assure temperature tolerances within 5 degrees.

QUALITY CONTROL of this kind* is important to users of Bolton plug and shell fillings for:

- The economy of longer, trouble-free wear.
- Uniform hardness the entire knife length as well as throughout the plug and shell knives that make up a complete Jordan filling.
- Identical knife properties on each re-order.

*BOLTON is the only Fillings manufacturer with in-plant heat treating facilities.

For Fillings of *any metal*, in *any design*, for *any machine*

—buy BOLTON

Circulating Oil Quench for hardening and tempering.

Control Panel in rear of Heat Treating Furnace right.

John W. & Sons, Inc.

Lawrence, Massachusetts, U.S.A.

NEWS of the INDUSTRY

VAPOSPHERE collects gases that get by other equipment in kraft pulping

OXIDATION towers do their share in odor reduction prior to the recovery cycle

From Barrage Balloon to Vaposphere

Weyerhaeuser Controls Kraft Mill Odor at Mills in Northwest

AN IDEA BORN of a barrage balloon is helping to reduce kraft mill odor at two Weyerhaeuser Timber Co. plants in the Northwest.

After years of experiment, WTCo's pulp research scientists have developed ways to almost completely deodorize the kraft pulping process. Principal agent in the removal of sulfur compound odors is a unique 25-ft. steel bubble known as the "Vaposphere."

The new system has proved "90 per cent effective" at the 375-ton Springfield, Ore. kraft mill, and at the 250-ton Everett, Wash. bleached kraft mill.

Follow the Condensers

Condensers eliminate most of the odorous gases produced at the digesters and evaporators. Further control is obtained by oxidizing the black liquor ahead of the recovery cycle.

The Vaposphères go to work only on the minute chemical particles that escape the standard equipment. In the air, these atom-like particles amount to about one part in 1,000,000.

Work on the process was done at the firm's Longview, Wash. pulp research laboratory. Previous experiments had been made with such ready-made remedies as "masking" compounds.

Barrage Balloon Offspring

The Vaposphere is a steel ball that houses a rubber-treated diaphragm. This diaphragm swells up—like a balloon—to collect and store the gases that slide by the mill's condensing system. Once collected, the gases can be fed slowly and at a constant rate into a furnace, as is being done at Springfield.

COLLECTED GASES are fed into furnaces for burning at the Springfield mill

At Everett, the gases from the rooftop Vaposphere are siphoned off and destroyed by chlorine in the plant's bleaching department. It is said that the introduction of gas has no effect on the quality or color of the bleached pulp. The odor, however, is completely dispelled.

The Vaposphere's experimental ancestor was a war surplus barrage balloon. The balloon was used at Springfield as an "expandable container" in early efforts to collect the odorous gases.

$75,000 Experiment

In charge of the laboratory where the experimental work was done is Dr. Harold Bialkowsky. "Our laboratory investigations alone have amounted to thousands of man-hours and an expenditure of more than $75,000," he explains. "When you add to this the cost of equipment, it represents a considerable investment in solving the odor problem. Various types of controls have been tried elsewhere, but it remains for the human nose to prove how many of them have been successful."

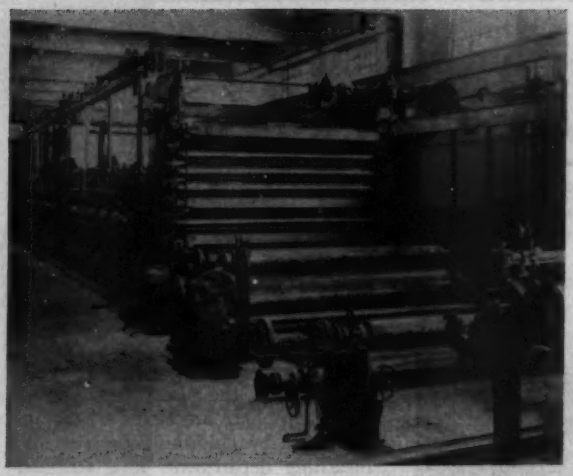
(Installation of similar equipment at the Longview mill awaits complete refinement of the gas-control system.)

Glatfelter to Increase Output at Spring Grove

Plans for a $12,500,000 improvement and expansion program were announced recently by P. H. Glatfelter Co., Spring Grove, Pa. P. H. Glatfelter III, president, said that the project would increase production by 50 per cent.

A completely new mill structure will be added to the present plant, followed by the installation of a paper machine for the manufacture of offset, tablet and bond papers.

Present output at Spring Grove is an annual 70,000 tons. On completion of the expansion, it will be increased to 103,000. (During 1954, the firm completed an initial $4,-



NEW NO. 2 fourdrinier machine at plant of Chemical Paper Mfg. Co.

VIEW SHOWING Chemical Paper plant at Holyoke, Mass.

New Machine for Chemical Paper Put into Operation During Firm's 75th Year

The $1,000,000 fourdrinier machine recently installed at Chemical Paper Mfg. Co. in Holyoke, Mass., has gone into operation. The unit replaces 70-year-old No. 2 machine, which was dismantled during the annual plant shut-down in July 1954.

According to Ralph H. Morrill, president of the firm, the installation is one of the ways in which Chemical Paper is marking its 75th year.

The modern Bagley-Sewall machine is designed for the production of lightweight and medium weight sulfite and rag content papers. It operates at speeds up to 600 fpm and will add some 3000 tons to the mill's annual capacity. The unit is 130 in. in width and trims at 120 in.

The machine replaced by the modern giant dated from the 1880s and could only turn out 250 fpm. It was 84 in. wide and trimmed at 72 in.

Since the Bagley-Sewall unit is wider than old No. 2, the machine room had to be widened 7 ft.; in addition, more overhead room was provided for the installation of a 7½-ton Whiting crane.

Including building renovations and other related costs, the total outlay for the expansion project has been about $1,025,000.

500,000 building and improvement program that included a bleach plant, chlorine dioxide generating equipment and a chemicals recovery plant.)

Rhinelander Rebuilds No. 3

Rhinelander Paper Co. at Rhinelander, Wis., will completely rebuild its No. 3 paper machine at a cost of $900,000. The unit will be shut down between April 15 and May 1.

No. 3 is a Yankee with a wire width of 132 in. It has no pre-dryers and an old low-pressure Yankee. The rebuilding includes installation of pre-dryers, high-pressure Yankee dryers, a Beloit pressure headbox, drive, dryer control system, and a completely new stock preparation system.

All machine parts are being supplied by Beloit Iron Works. The drive turbine will be built by Westinghouse Electric Corp. A final decision has yet to be made concerning the stock preparation equipment.

No. 3 is one of eight machines in operation at Rhinelander.

Powell River to Spend $1,500,000 in 1955

Powell River Co. Ltd. will spend $1,500,000 during 1955 on expansion and development. The annual production of newsprint is to be boosted by 30,000 tons.

The program was announced by R. M. Cooper, vice president and resident manager of the Powell River, B. C. mill. He declared that by 1956 newsprint output will have increased from a yearly 380,000 tons to 410,000 tons.

The firm is planning a new office building that will cost between $350,000 and $400,000. Other projects include a new steam plant, locker room, and lighting.

West Virginia to Spend $100 Million in Five-Year Expansion Program

West Virginia Pulp & Paper Co. has announced an expansion program calling for the expenditure of $100,000,000 in new plant and equipment over the next five years.

Full details have not been revealed, but included in the project are the purchase of two paper machines of advanced design and the possible erection of a pulp and paper mill at one of the firm's present locations.

The new machines and supporting equipment will cost between $20,000,000 and $25,000,000. One will produce kraft products at Charleston, S. C., while the other will turn out high quality lightweight printing papers at Luke, Md.

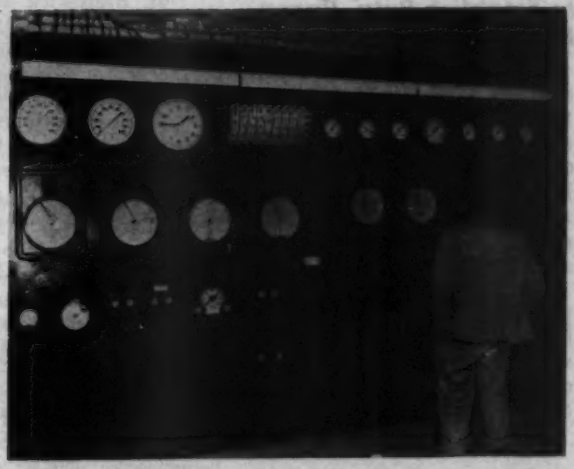
Plans call for the new mill to be located in central Pennsylvania, the most likely site being Tyrone, where Westvaco operates a 145-ton mill producing publication papers. Present projections anticipate a mill capable of producing 300 daily tons of hard white papers.

The firm's principal subsidiary, Hinde & Dauch Paper Co., has recently started construction of a $2,350,000 box factory at Gastonia, S. C.

Westvaco is also developing plans in Canada where it has a majority stock ownership in Hinde & Dauch of Canada Ltd.

1954 IMPROVEMENTS at various Mando plants cost an estimated $6,100,000. Included was the modernization of No. 7 paper machine at Fort Frances (left) at a cost of more than $1,000,000. Machine speed was increased some 25 per cent to 1500 fpm; a feature of the project was the complete enclosure of the dryer section in a Ross-Hooper hood. At the right is the new steam boiler at Fort Frances, which has made available an additional 50,000 lb. steam per hour. It is a Foster Wheeler SA unit designed to use Canadian lignite and is scheduled to be adapted to burn bark and other wood refuse

A MAJOR PORTION of the Mando expansion program was the $3,000,000 grinder room at Fort Frances, which when in full production will have a combined output of 455 daily tons of specialty paper, newsprint and Insulite groundwood pulp. A portion of the 300-ft. rubber belt conveyor for sorting wood is shown at the left.



In another expansion move, Mando installed at International Falls a new kraft black liquor recovery boiler manufactured by Combustion Engineering Inc. The boiler's control board, shown at right, is the nerve center from where the unit's 60,000 lb. steam per hour capacity is regulated

Mando to Install New Machine at Kenora; Reviews 1954 Expansion

Minnesota & Ontario Paper Co. plans to add a high-speed fourdrinier newsprint machine to its growing Kenora, Ont. plant. The unit will have an annual capacity in excess of 80,000 tons.

Machine installation and related construction projects will be undertaken by Mando's subsidiary, Ontario-Minnesota Pulp & Paper Co. Ltd., and will cost an estimated $16,800,000. The expansion program will continue through 1957.

According to the firm, the paper machine (No. 10) will permit greater flexibility in the production of high grade specialty papers at Fort Frances, Ont., and International Falls, Minn.

Insulite Expansion

Mando's Insulite Div. is moving toward the production of higher density products at International Falls, according to W. H. Schlafge, general manager.

Mr. Schlafge declared that the Insulite manufacturing facilities are being altered, the changes to include the installation of high density equipment and the streamlining of fiberboard coating and fabricating equipment. All fabricating machines are to be set up in a straight-line type of operation.

The one-story building extension to house the new and rearranged production facilities will have a floor space of some 85,000 sq. ft.

In a year-end report, Mando's president, Robert Faegre, disclosed that the firm spent an estimated $6,100,000 during 1954 for expansion, upgrading and diversification. The program, he added, has resulted in the expenditure of more than $45,000,000 since the end of World War II.

Other 1954 Projects

Mando's daily production now includes about 1000 tons of newsprint and groundwood and chemical specialty papers; 1,300,000 sq. ft. of Insulite building, decorative and in-

EXECUTIVE COMMITTEE of the Pulp and Paper Foundation at North Carolina State College meets to organize. Members are (l to r) K. F. Adams of Halifax Paper Co. (president), Charles Huestis of Southern Paperboard Corp., E. J. Gayner III of Brunswick Pulp & Paper Co., D. J. Thomson of Champion Paper & Fibre Co., and H. D. Hinman of International Paper Co.

LUNCHEON SOUTHERN style was served at the Raleigh meeting. Among those present were (l to r) D. J. Thomson of Champion; Forrest Brainerd of Scott; E. J. Gayner III of Brunswick; Carey Bostian, chancellor of the college; Dean Richard J. Preston of the school of forestry; Wilbur Gillespie of Gaylord Container and Colin Gardner of Gardner Board & Carton

Industry Executives Meet to Establish Pulp, Paper Foundation at N. C. State

Executives of the pulp and paper industry met recently at Raleigh, N.C., to organize the new Pulp and Paper Foundation Inc. at North Carolina State College. Main objective: finding ways and means of advancing the pulp and paper technology program at the college's school of forestry.

The foundation approved the expenditure of $9000 for scholarships to be awarded to future forestry students who make acceptable records. The scholarships will be worth $600 annually for a four-year study.

Elected president of the foundation was E. J. Gayner III, president of Brunswick Pulp & Paper Co. Other officers: Dwight J. Thomson, vice president of Champion Paper & Fibre Co., vice president; L. L. Ray, assistant to the chancellor and director of foundations at the college, secretary; J. G. Vann, college business manager, treasurer.

The pulp and paper technology program at the school is headed by Prof. C. E. Libby, at one time head of the pulp and paper department at the New York State College of Forestry in Syracuse.

Pulp and Paper Lab

It was announced during the meeting by Dean Richard J. Preston, head of the school of forestry, that bids have already been let on the new pulp and paper technology laboratory.

Membership in the Pulp and Paper Foundation will be open to paper mills, paper converters, equipment manufacturers, equipment and chemical suppliers, and individuals.

Firms represented at the organizational meeting were, in addition to Champion and Brunswick: Buckeye Cotton Oil Co., Continental Can Co., Gardner Board & Carton Co., Camp Mfg. Co., Gaylord Container Corp., Halifax Paper Co. Inc., International Paper Co., North Carolina Pulp Co., Riegel Paper Corp., Scott Paper Co., Southern Paperboard Corp., the Mead Corp. and Union Bag & Paper Corp.

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sulating wood fiber boards, and thousands of lineal feet of treated poles, ties, lumber, piling and other products.

Modernization during 1954 included Insulite production improvements; a new kraft liquor recovery unit at International Falls; the start-up of the new grinder room at Fort Frances; the speed-up and modernization of Fort Frances' No. 7 paper machine; white water and decker improvements, also at Fort Frances, in addition to a new steam boiler, and numerous other projects.

Doeskin Buys Sitrue

Doeskin Products Inc. has bought for $2,000,000 all the outstanding stock of Sitrue Inc. and its two affiliates.

For the purchase price, Doeskin acquired some $1,000,000 in net current assets and $1,000,000 in fixed assets, including a four-machine paper mill at Clayville, N. Y., and a converting unit at Utica. The Sitrue affiliates included in the deal are the Superfine Paper Mills Inc. and Sterilek Co.

Scott Starts Third Machine at Everett; Anacortes Expansion

A third high-speed paper machine has "gone on the line" at the Scott Paper Co. plant in Everett, Wash. Also installed: supporting equipment and pulp stock preparation units.

Immediately after the start-up of No. 3, construction crews began work on No. 4, which is scheduled to go into operation later this year.

Also included in the large-scale building project at Everett is the installation of a new boiler to provide the additional capacity required by the paper machines and auxiliary equipment.

Anacortes Expansion

Scott has also revealed that a major expansion program will soon get underway at the Anacortes, Wash. mill of Coos Bay Pulp Corp.

Featured will be a new wood preparation plant that will be devoted to the processing of cordwood, including alder, for use in manufacturing bleached sulfite pulp. It will be the first such operation at Anacortes, thus providing an entirely new source of wood.

Also included will be the operation of two mechanical barkers.

News of the Industry . . .

Logs are carried through the barker on trunnion wheels that rotate the log. The bark is removed by side heads with angled teeth. Rotating wire brushes located behind the heads remove the bark layers.

Other equipment planned for the debarking mill includes a 112-in. chipper, conveyors, log hopper, and a large crane for wood handling. Also, stock and caustic soda storage tanks are to be erected.

Continental Machine Rebuild Begun

Continental Paper Co. of Ridgefield Park, N. J., is renovating its No. 1 paper machine at an approximate cost of $500,000. The work is to be completed by the end of March.

According to the firm, the installation of an entirely new forming section will permit increased uniformity in formulation, thus allowing better control for the production of all folding box boards.

The equipment has been designed by the Continental engineering department and embodies the "latest international thinking in vat design."

In another modernization project, the firm's No. 2 machine has been recently equipped with clay-coating equipment.

Newsprint Production Record Claimed by Powell River

A world's daily production record for a single newsprint mill has been claimed by Powell River Co. Ltd. of Powell River, B. C.

In a 24-hour period on January 9 the mill turned out 1219.9 tons. An unusually high efficiency—96.8 per cent of the plant's eight paper machines—made the new mark possible. (The former daily record—1213.8 tons—was established at Powell River December 4, 1954.)

Crossett Speed Record

On November 22, the "Pioneer" paper machine at Crossett Paper Mills in Crossett, Ark., turned out 30-lb. kraft wrapping paper at a speed of 2024 fpm. The rate was well above the old mark of 1935 fpm.

The Pioneer, a Beloit Iron Works

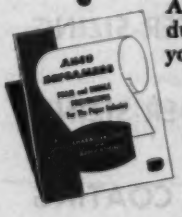
A Plain Case of

TWO HEADS BEING BETTER . . .

THE CASE OF FOAM CONTROL!

It's an old adage but never more truly applied than in the case of your consulting an Ahco Defoamer technician when foam is stealing profits from processing.

You can start proving the old adage by asking for the new AHCO DEFOAMERS technical product literature shown here . . . then talk with your AHCO DEFOAMER man . . . two heads could produce the most effective foam and bubble control you've ever experienced.



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News of the Industry . . .

machine with a vacuum pickup arrangement, operated at the record-breaking speed for a period of eight hours and 24 minutes. The unit was designed for 2000 fpm and was put into operation in January 1950.

$500,000 Blaze Sweeps O-M Grinder Room

Fire swept through the two top floors of the grinder room building at Ontario-Minnesota Pulp & Paper Co. Ltd.'s Fort Frances, Ont. mill February 7. One man died. He was Emil Shine, 58, mill fire marshal, who was overcome by smoke.

It was expected that salvage and maintenance crews would have the grinder room back in operation within five days of the blaze, which caused damage estimated at approximately $500,000.

The fire started on the second floor, where pulpwood is stored preparatory to feeding it to 13 semi-automatic grinders. According to Robert Faegre, executive vice president of Minnesota & Ontario Paper Co., O-M's parent firm, certain wood conveying and handling facilities were damaged. However, heavy grinding equipment and electrical motors were not affected.

Hot metal from a welding operation was apparently the cause of the blaze. The building itself is of concrete and steel construction and was not heavily damaged structurally.

The company's wood and other supplies were entirely adequate at the time of the fire. For the few days that the grinding room facilities were out of operation Mando purchased needed wood pulp and paper from other manufacturers.

Prominent Industry Men Lecture at Lowell

A series of lectures on papermaking is being presented through the second semester at Lowell Technological Institute in Lowell, Mass. Participating as guest speakers are prominent technical men representing all phases of the industry.

The series, which began February 8 and will continue through May 17, is designed primarily for juniors in the Lowell papermaking course. However, the public has been invited.

Remaining lectures are as follows:

March 22—"Cylinder Wet End," John R. Lunt of Robert Gair Co. Inc., Haverhill, Mass.; March 29—"Paper Drying," John Lynch of J. O. Ross Engineering Corp., Boston; April 12—"Fine Paper Manufacture," L. B. Tucker of Crane & Co. Inc., Dalton, Mass.; May 3—"Coarse Paper Manufacture," Gordon L. Benson of St. Regis Paper Co., East Pepperell, Mass.; May 10—"Publication Papers," A. M. Altieri of Tileston & Hollingsworth Co., Hyde Park, Mass.; May 17—"Applications of Chemical Engineering in Pulp and Paper Manufacture," Lyle C. Jenness, head of the department of chemical engineering at the University of Maine, Orono.

Construction Scheduled for C-Z's New Lulu Island Plant

Construction is scheduled for May for the $4,000,000 paper converting and box manufacturing plant to be built by Crown Zellerbach Canada Ltd. at Lulu Island, B. C. Production is expected early in 1956.

Located on a 150-acre site on the south arm of the Fraser River, the plant will cover more than 335,000 sq. ft. A feature will be a 96-in. Langston corrugating machine valued at more than $500,000.

The main building will measure 800 by 280 ft. Specialty paper products will include napkins, towels, fruit wrap, bread wrap, waxed lunch rolls, and solid fiber and corrugated shipping containers.

Alberta Mill Construction Scheduled for Spring

Construction of a $30,000,000 pulp mill near Edson, Alta., will start as soon as spring weather conditions permit. (Edson is about 125 miles west of Edmonton.)

The mill will have a daily capacity of 300 tons and will be operated by North Western Pulp & Power Ltd., a subsidiary of North Canadian Oils Ltd. and St. Regis Paper Co.

NOTABLES IN THE PAPER industry admire the book collection recently given to Western Michigan College by D. Clark Everest of Marathon Corp. Included in the group are (front row, l to r) Dr. R. G. Macdonald, executive secretary of Tappi; Dr. Paul V. Sangren, college president; Mr. Everest, and O. W. Callighan, member of the paper technology library committee. In the second row are Bert H. Cooper, vice president of Kalamazoo Paper Co. and chairman of the paper technology advisory committee; Dr. Fred Chappell of Hercules Powder Co., chairman of the library committee, and Harry Hadley of Gardner Board & Carton Co., president of the Superintendents Association.

Valuable Collection Given Western Michigan Library by D. Clark Everest

D. Clark Everest, chairman of the board of Marathon Corp., has presented some 38 volumes on papermaking to the library of the paper technology department at Western Michigan College, Kalamazoo. The books are valued at nearly $2,000.

In a brief ceremony, Mr. Everest made the presentation personally while more than 100 representatives of the industry looked on.

Dating back to 1801, the collection includes titles from the United States, England, Holland, Germany, France and Canada.

Particularly of note are 12 volumes by Dard Hunter. The books, while notable in themselves for the papermaking knowledge they contain, are also worthy of attention for their manner of origin. Not only did Mr. Hunter do the actual research and writing, he also made the paper, designed the type, made the type matrices, cast the type and printed and bound each volume.

Industry Objects to Use of U.S. Funds in Pulp, Paper Developments Aboard

Strong objection has been raised to the use of U. S. government funds in the development of pulp and paper projects in foreign countries where such projects have been found to be uneconomic.

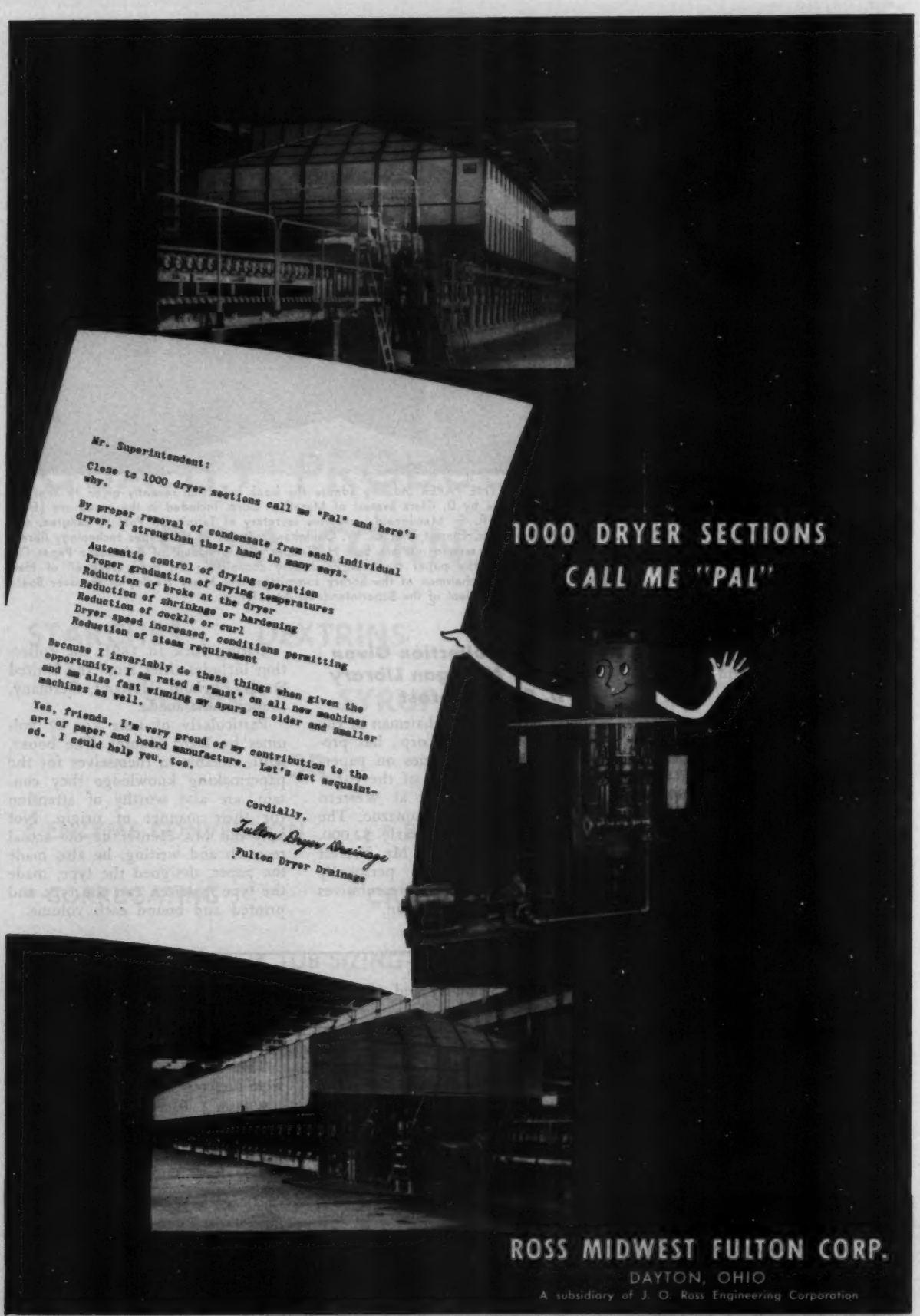
At a recent meeting at the U. S. Department of Commerce, Washington, D. C., the Pulp, Paper and Paperboard Industry Council told officials of the Business and Defense Services Administration that many proposed projects abroad have been investigated by the U. S. industry and found to be unsound.

Declaring that the yardstick used for the investment of public funds should be substantially the same as that used by private capital, members of the Council revealed that in many instances the projects had been considered by industrialists in the countries involved. They themselves had termed the ventures uneconomic.

The industry spokesmen indicated general endorsement of the reciprocal trade agreement program of the administration. They placed considerable emphasis, however, on the importance of introducing into these tariff negotiations the importance of reciprocity as a "two-way street." Concern was also expressed about the full exercise of the peril point and escape clause provisions in the present program.

The following Council members were present:

William J. Bailey, West Virginia Pulp & Paper Co.; R. E. Bundy, Fibreboard Products Inc.; George E. Dyke, Robert Gair Co. Inc.; J. B. Faegre, Minnesota & Ontario Paper Co.; Edward R. Gay, St. Regis Paper Co.; O. J. Hardenbrook, Union Bag & Paper Corp.; Stuart E. Kay, International Paper Co.; D. C. Knowlton, Knowlton Bros.; D. S. Leslie, Hammermill Paper Co.; James P. Lewis, the J. P. Lewis Co.; Albert Luhrs, National Paperboard Association; M. C. McDonald, Great Northern Paper Co.; Clyde B. Morgan,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News of the Industry . . .

Rayonier Inc.; George Olmsted Jr., S. D. Warren Co.; W. Irving Osborne Jr., Cornell Paperboard Products Co.; Peter S. Paine, New York & Pennsylvania Co.; Marvin M. Swaim, Alton Box Board Co.; E. W. Tinker, American Paper & Pulp Association; M. C. Walsh, Champion Paper & Fibre Co.; Howard E. Whitaker, the Mead Corp., and R. W. Wortham, Southland Paper Mills Inc.

Scott to Spend $6,000,000 at Winslow Sulfite Mill

Directors of Scott Paper Co. have authorized the expenditure of $6,000,000 to expand and improve its newly acquired Winslow, Maine sulfite pulp mill.

Most of the outlay will cover the purchase and installation of a paper machine, together with stock preparation, converting and other related facilities and equipment. Provision will be made for the installation of an additional paper machine.

Addition of the new machine will bring to seven the number of units now operating at Winslow. The H. & W Div. mill was recently acquired by Scott in the purchase of the properties of Hollingsworth & Whitney Co.

U. S. Forest Service Marks 50th Birthday

A never-ceasing campaign for conservation during the past 50 years has marked the growth of the United States Forest Service, which on February 1 marked its first half-century.

Fifty years ago the lumbering industry was chopping through the nation's dwindling forests and leaving wastelands in its wake. Today, the forest industries are managing their lands for continuous production while encouraging farmers to consider trees as a recurring crop.

Millions of woodland acres stripped by cutting and by fires have been replanted by private owners and government foresters. The nation's forests today produce all the wood that the United States requires, and according to the estimate of a U. S. F. S. expert, that production can be doubled if necessary.

The service, created by an act of Congress in 1905 through the efforts of President Theodore Roosevelt,

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has grown from a handful of crusading conservationists into a great land-management, research and educational agency within the U. S. Department of Agriculture. It has more than 6700 permanent employees—about 12,700 at the height of the forest fire danger season.

A half-century ago the few areas set aside as national forests were in remote "back country." Today, the Forest Service operates 115 national forests aggregating 181,151,000 acres in 39 states, Alaska and Puerto Rico. These supervised areas comprise 16 per cent of the nation's commercial forest land.

The more than 181,000,000 acres are under the latest scientific management techniques. They supply annually more than 5 billion board feet, and the harvest is growing.

Halifax Plans Pulp Mill Digester Room Improvements

Halifax Paper Co. of Roanoke Rapids, N. C., has announced that the over-all modernization program at the pulp mill has been expanded to include the digester room.

Improvements will include two 3000-cu. ft. digesters, associated chip bins and conveyor, and related facilities. The new digesters will have the same size, shape, capacity, etc. as the present large units. However, the wall thickness will be 1½ in., and the units will be fabricated to provide for easy future addition of forced circulation features.

Engineering and construction management services are being provided by Ebasco Services Inc. in consultation with Halifax engineers and operating staff. The digester bodies are being manufactured by Chicago Bridge & Iron Co. at its Birmingham, Ala. plant. The entire addition is expected to cost about $158,000.

P I Expansion Notes

Marathon Corp.'s new food package manufacturing plant at Modesto, Cal., was expected to be in operation in February. Equipment in operation includes printing presses, cutting and creasing machines, waxers and folders.

International Paper Co. has acquired substantially all of the outstanding stock of A. M. Collins Mfg. Co., Philadelphia manufacturer of specialty coated papers. The Collins organization will operate as an International division.

Watervliet Paper Co. of Watervliet, Mich., has announced plans for a $1,200,000 expansion of its experimental pulp plant.

Diamond Match Co. has acquired the assets of General Package Corp. of Chicago. The latter firm will continue under its present management and policies as a Diamond division.

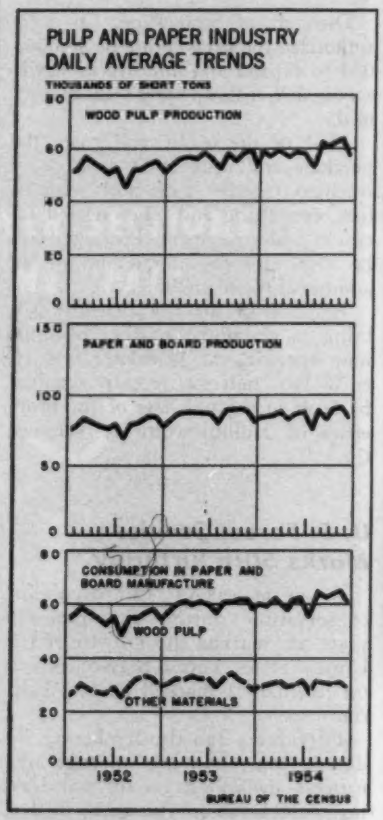
U. S. Paper and Paperboard Production

	Dec. 1954 (tons)	Nov. 1954 (tons)	Dec. 1953 (tons)	Total 1954* (1,000 tons)	Total 1949 tons)
Paper and Board, total	**2,169,696**	**2,293,633**	**2,023,074**	**26,657**	**20,315**
Paper, total	**964,004**	**997,132**	**926,858**	**11,615**	**9,198**
Newsprint	111,016	107,694	88,299	1,191	918
Groundwood paper (uncoated)	69,680	72,907	66,257	808	675
Printing and converting (coated)	95,364	100,647	97,394	1,215	887
Book paper (uncoated)	125,840	128,877	125,977	1,560	1,416
Fine paper (writing, cover and text, bristols, thin paper and other)	118,288	116,306	104,122	1,324	1,015
Coarse paper (unbleached kraft, glassine, greaseproof, vegetable parchment and other)	279,128	297,084	279,291	3,429	2,758
Special industrial paper (including absorbent paper)	46,471	47,598	46,336	526	334
Sanitary tissue stock	99,658	105,656	101,571	1,320	1,008
Tissue paper (except sanitary and thin paper)	18,559	20,363	17,611	241	187
Paperboard, total	**967,676**	**1,039,761**	**904,172**	**12,047**	**8,907**
Container board, total	518,520	580,683	481,863	6,433	4,680
Liners	344,391	395,611	317,484	4,336	3,132
Corrugating material	149,177	161,615	142,169	1,817	1,306
Container chipboard	24,952	23,457	22,210	280	242
Bending board	291,497	293,729	276,103	3,671	2,613
Nonbending board	68,977	76,642	64,706	920	748
Special paperboard stock	82,306	82,272	75,117	944	873
Cardboard	6,376	6,435	6,383	79	83
Wet machine board, total	11,340	10,958	11,986	132	131
Construction paper and board, total	**226,676**	**245,782**	**180,058**	**2,863**	**1,990**
Construction paper	103,902	112,874	85,438	1,356	1,151
Hardboard and insulating board	122,774	132,908	94,620	1,507	839

*Preliminary report. *Source: U. S. Department of Commerce.*

December Pulp, Paper and Board Production

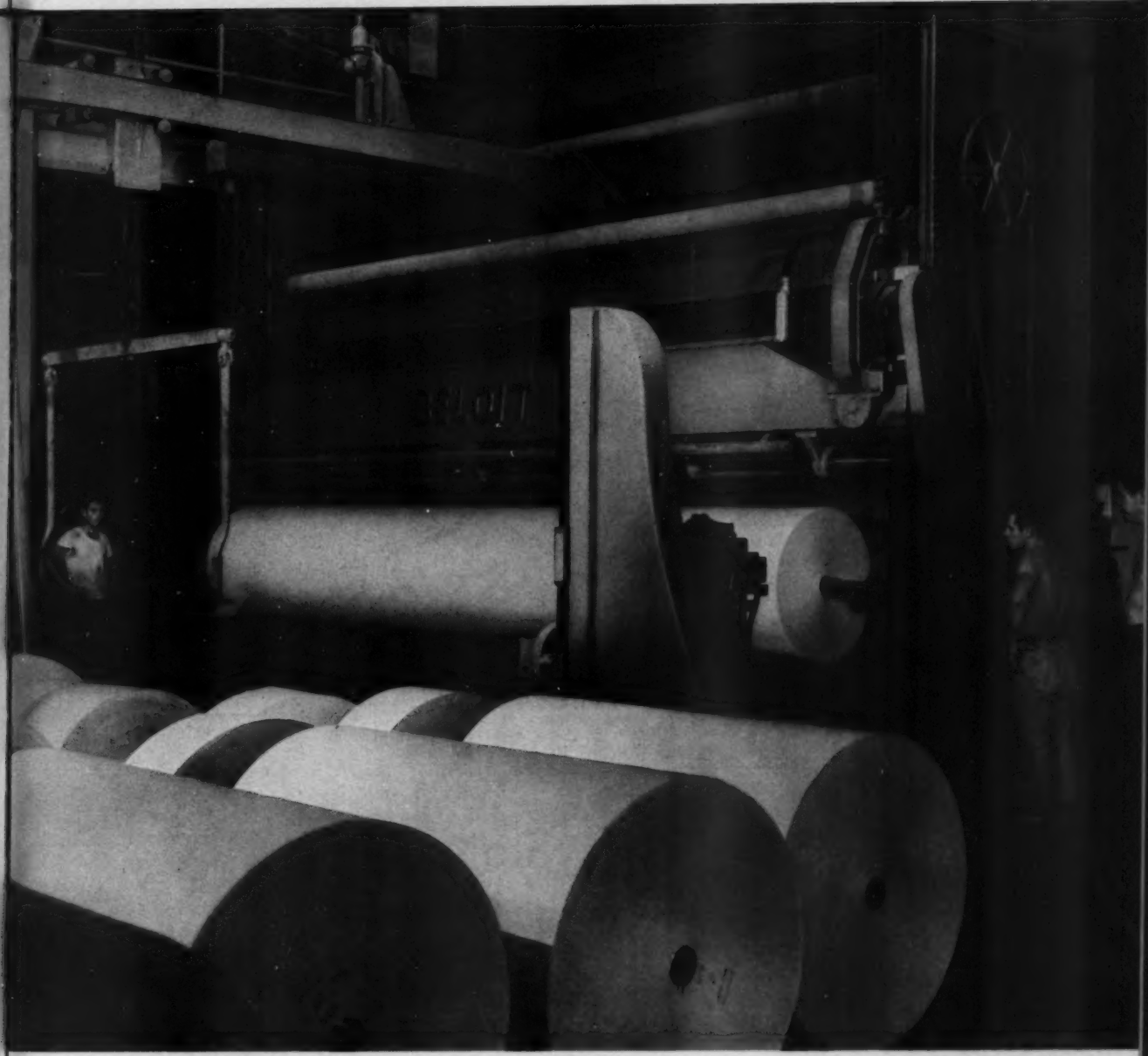
Paper and board production during December amounted to 2,169,696 tons, according to a report released by the Bureau of the Census. This is more than 7 per cent above the 2,023,074 produced in December a year ago. Paper production amounted to 964,004 tons, 4 per cent above the 926,858 tons of December a year ago. The output of paperboard during the month was 967,676 tons, reflecting a 7 per cent increase from the production of 904,172 tons reported for December 1953.



Pulpwood receipts at the pulp mills during December amounted to 2,645,263 cords, with consumption at 2,428,077 cords. Month-end inventories were 5,057,976 cords.

Wood pulp production during December amounted to 1,483,921 tons, as compared to the 1,346,400 tons produced in December, 1953.

Wood pulp inventories at the end of December at the paper and board mills amounted to 516,051 tons, showing a decrease of less than 1 per cent during the month. Month-end stocks at the pulp mills were 157,576 tons.



HIGH-SPEED, HEAVY-DUTY Model "L" Winder is successfully handling the newsprint production of the No. 1 Beloit machine at Bowaters Southern, Calhoun, Tennessee. Every detail has been designed for economical, high-speed production and ease of operation. Clean-cutting shear slitters and positive control of roll hardness and uniformity give highest quality rolls.—*Beloit Iron Works, Beloit, Wis.*

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The Paper Industry

March 1955

Scientific manpower — a problem of high priority rating

WHILE NO ONE will dispute the assertion that ideas and know-how are the prime movers of modern industry and of an expanding national economy, the need for providing an environment that will attract the best of our potential brain power into the fields of science and higher learning is not as widely recognized.

Too many radio and television programs leave our teen-age groups with the impression that to be a great scientist one must either be a timid and impractical college professor, a person with limited attributes except where it concerns the pursuit of a single brilliant specialty, or sometimes an anti-social genius who may develop into a spy and renegade. In relatively few programs is the scientist depicted as he really is or aspires to be — a highly responsible member of society, cognizant of both the scope and limitations of current knowledge, with an insatiable curiosity for the unknown, and a high capacity for work, mental perception, and logical reasoning.

As long as we continue to present the scientist in unflattering disguise to the adolescent generation, we shall be confronted with an acute shortage of highly qualified scientific and engineering personnel, especially for the ranks of which we require a maximum of performance.

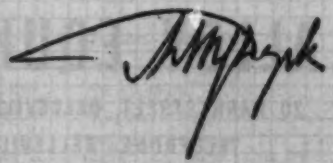
While the major educational effort necessarily must be directed toward influencing youth, the true status of science and the scientist must also be interpreted to the public at large. Most of us go through a stage of reappraisal of values upon reaching maturity, and we are quite willing to give science its due credit for our high standard of living and the many benefits that are enjoyed by modern society. Still, there remains an attitude of suspicion and distrust that is seldom completely removed.

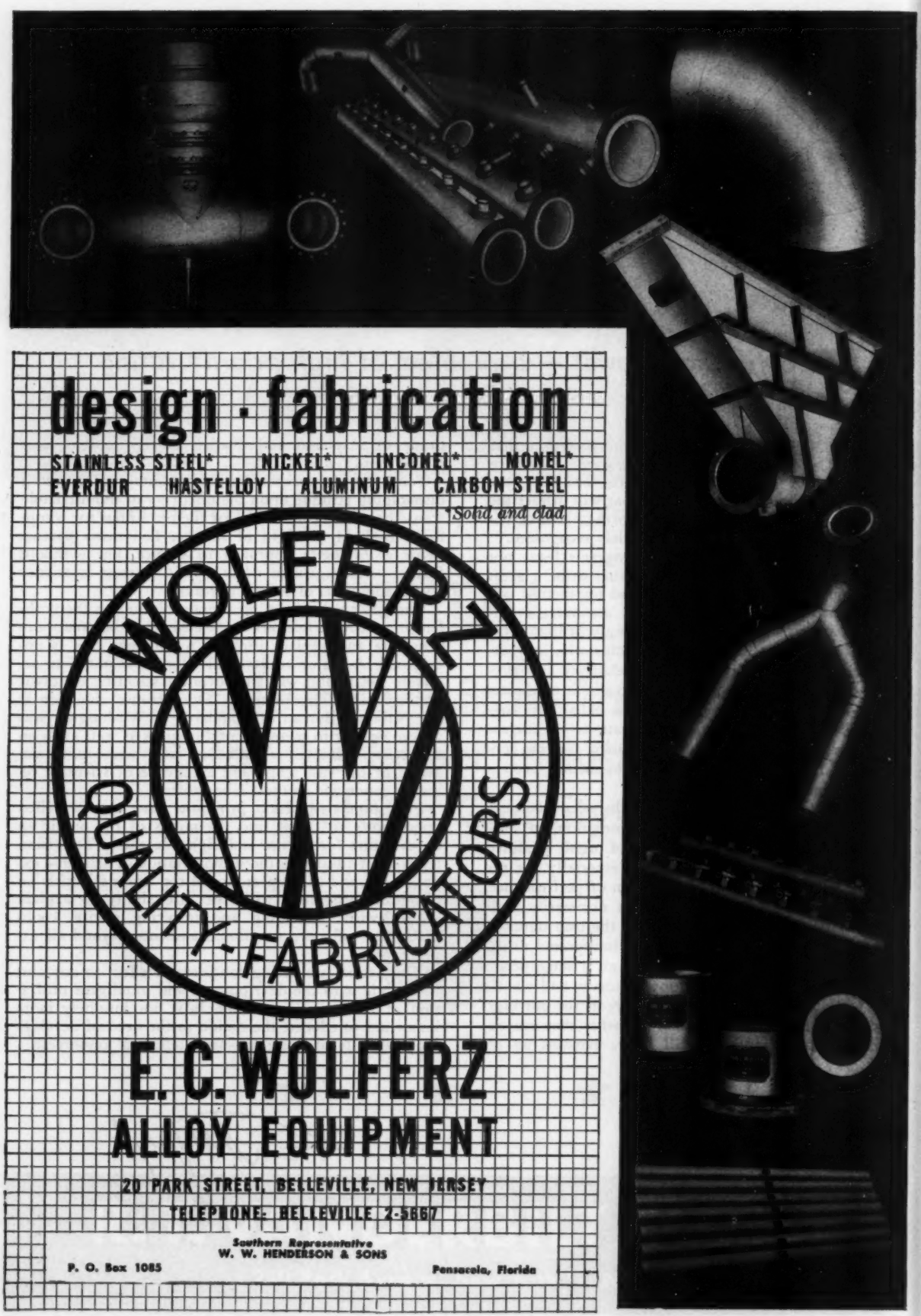
Too often do parents show a discouraging or even a disparaging attitude upon the discovery of unmistakable traits that clearly mark one of their children for a top-flight rank in the field of science. Too many parents favor a *dilettante* approach to science, but withhold further encouragement when a mild interest in science changes into one of serious devotion.

There is no short cut, no simple solution, to the problem of scientific manpower. Science must become more articulate and explain itself in a language that is understood. A major educational effort is required to acquaint the public with the over-all scientific endeavor of the nation. The February "Open House" function at the National Bureau of Standards in Washington was an eye opener to members of Congress as well as to an appreciative television audience who were quite unaware of the vast scope and excellence of scientific research conducted in these laboratories.

Educational television programs have an unexcelled opportunity to instill into the minds of the public an appreciation for science and higher learning. Television lends itself ideally to the demonstration of scientific experiments, and the appearance of top flight scientists on television programs, with the rare ability to explain science with fascinating and inspiring clarity, could reach and influence a national audience beyond all expectations.

The nation is exerting considerable effort to acquaint the public with the development and intelligent utilization of its natural resources. Is it not infinitely more important to educate the nation to the need of developing and fully utilizing its vast intellectual resources?





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Clarence Francis, formerly Chairman of Board of General Foods Corp., speaks at Annual TAPPI luncheon.

George H. Pringle, 1954 TAPPI President, and Karl Elderkin, Bowaters Southern Paper Corporation, the newly elected President.

Vance P. Edwardes received the TAPPI medal from Clark C. Heritage of Weyerhaeuser Timber Co.

40th Annual Tappi meeting

THE ELECTION OF Karl Elderkin, Bowaters Southern Paper Corporation, as 1955 TAPPI president, was announced at the general meeting of the 40th Annual Tappi Conference. Mr. Elderkin has served two terms as Vice President of Tappi.

W. D. Harrison, Production Vice President of Riegel Paper Corporation, was elected Vice President of Tappi, and the newly elected executive committeemen are Donald J. Goodman, General Superintendent of Sorg Paper Co., James R. Lientz, General Manager of the pulp and paper division of Union Bag and Paper Corp., Joseph J. Thomas, Research Chemist for S. D. Warren Co., and John C. Wollwage, Mill Manager for Kimberly-Clark Corp.

Following the reports by Dr. R. G. McDonald, Secretary, George H. Pringle, President and R. S. Kellogg, Secretary Joint Text Book Committee, Dr. John Lewis, professor and head of the Department of Paper Engineering at Lowell Technological Institute, spoke on research facilities at Lowell Technological Institute.

The technical paper presented at the general meeting was on "New Air Felting Method for Making Tissues, Batts, and Boards", by Bror E. Anderson, A. B. Dick Co., and James d'A Clark. The new method describes a technique of depositing fibers from an air suspension in a cylindrical chamber through a grid separator adapted to the type of the fiber being used. The fibers form a uniform. non-directional web on a traveling wire screen. A slight vacuum under the screen prevents the fibers from being blown into the room. A series of heads can be installed over the wire to make laminates or to increase the speed of web-formation. The process is said to be of particular advantage with fiber length of 3/8 to 3/4 in.

A special feature at the TAPPI Annual Luncheon was the presentation of the TAPPI Medal to Vance P. Edwardes. The presentation was made by Clark C. Heritage of Weyerhaeuser Timber Co. The luncheon address, on packaging problems that confront the food industries, was made by Clarence Francis, former chairman of the Board of General Foods Corp.

Deinking

A new approach to pulp screening was described in a paper by A. C. Smith, Newton Falls Paper Mill Inc., and Fred Schorken, Dorr-Oliver, Inc., The Oliver-Ahlfors screen consists of a screen vat with plates on top, and a mechanically agitated diaphragm as the bottom member is supported by a cast aluminum diaphragm plate. The pulp is fed into the vat at constant uniform head and flows upward through the four .012-inch cut plates per screen.

Among the advantages of the Oliver-Ahlfors screen, which is now in operation at Newton Falls Paper Mills, Inc., is the reduction of floor space from 800 to 510 sq. ft. and the improved uniformity of screened products.

The use of centri-cleaners for cleaning the inked stocks, with particular emphasis on the removal of ink balls, adhesives, and other light types of impurities, was discussed in a paper by J. L. Clouse, Oxford Miami Paper Co., and E. Rastatter, Bauer Bros. Co.

In a paper entitled "The Use of Paper Stock", Henry J. Perry compared paper stock grades, their sources of major contamination, and stressed the need for review of current paper stock processing methods with the view to developing and introducing new methods.

Turbo-blowers

Robert Thomann, Sulzer Brothers of Switzerland, described the use of Turbo-blowers for aspirating air from paper machines. The advantages provided by this method are: (1) the use of multi-stage units for central aspiration from all the suction points of the paper machines; (2) lower power requirements as compared with

Deinking: J. J. Forsyth, International Paper Co., Chairman; and papers were presented by F. Schorken, A. C. Smith, T. Calhoun, J. L. Clouse, E. Rastatter, and Henry J. Perry.

Pulp Purification: W. H. Rapson, Toronto University, Chairman; speakers and panel members were J. F. Haller, W. W. Northgraves, W. D. Harrison, D. H. Baker, G. W. Brumley, C. E. Hartford, and A. Scholander.

Papermaking Fibers: James d'A Clark, Chairman; papers were presented by T. H. Isenberg and C. P. Brady.

Corrugated Containers: W. D. Arbuthnot, Fibre Board Container Corp., Chairman; papers presented by F. A. Leser, Jr., K. A. Wohl, P. Kaplan, and W. Ward.

Dissolving Pulp: F. A. Simmonds, U. S. Forest Products Laboratory, Chairman; papers presented by D. D. Bachlott, B. G. Hoos, Elizabeth Barabash, A. J. Rosenthal, B. B. White, J. E. Salmon, R. L. Mitchell, M. A. Milett, W. R. Moore, and R. C. Weatherman.

Semichemical Pulping: J. N. McGovern, Parsons & Whittemore, Chairman; papers were presented by E. L. Keller, J. M. Woods, J. S. Hart, F. L. Wells, R. H. MacClaren, D. J. MacLaurin, J. E. Stone, C. Forderreuther, A. Pollak, R. S. Aries, R. H. Boehm, and R. M. Husband.

those of liquid-ring pumps; and (3) the utilization of the work of compression in the form of heat.

Cylinder board

H. P. Espenmiller, Black-Clawson Corp., discussed the new Shartle Alligator Refiner. Described as a conical refining engine, the refiner consists of a perforated rotating element with ⅜-inch diameter holes in the refining zone between the rotor and stator. The stator is also perforated, with ⅛-inch holes. Stock flow in the refining area is divided. Part of the stock discharges into the long fiber chamber and another part is forced by ram-like pressures produced by the rotor through the ⅛-inch holes in the stator into the short fiber chamber. Both stocks are discharged through a mix valve, which permits the withdrawal of various percentages of fiber length as desired.

Among the advantages provided by the alligator refiner are: (1) power savings as high as 67 per cent; (2) improvement of stock quality; (3) particular adaptability of the alligator for refining hardwood pulps—kraft, soda, or semi-chemical.

Other observations made with the use of the alligator are: (1) no noticeable cutting of fiber; (2) rapid reduction of freeness without cutting; (3) high maintenance of tearing, bursting, and tensile strength; (4) high maintenance of folding strength; (5) excellent fibrillation; (6) improvement of hydraulic efficiency; (7) absence of operator difficulties in refiner control.

P. S. Bolton, of Robert Gair Co., drew attention to the importance of increasing the use of waste paper. Utilizing standard equipment, he said, "it is now possible to recover the lower grades of waste paper to produce pulps equivalent to hardwood semi-chemical pulps".

O. T. Witworth, Black-Clawson Corp., discussed the operating difficulties of sheet formation on the mold resulting from higher machine speeds and said that some of these difficulties had been overcome by the use of exhauster systems which prevent slippage and rain, produce a tighter and more even sheet, remove more water and eliminate foam inside the molds.

J. J. Higgins, Ohio Boxboard Co., reported on the effect of a smoothing press and primary and secondary calender dryers on the quality of the coated board. Through installation of a smoothing press about 2/3 of the way through the drying section the finish of the coated board and its surface for half-tone reproduction was greatly improved. Calender dryers, it was reported, result in the formation of a denser sheet, removal of moisture added at the calender stack, and the production of a flatter sheet.

Fundamental Research

In a study of the rate of diffusion of sodium and ammonium-based neutral sulfite liquors into wood, J. S. Stone and C. Foerderreuther, Institute of Paper Chemistry, reported that there was no significant difference between the rates of diffusion. The authors used aspen blocks of different lengths and moisture content and water saturated birch blocks. The temperature of the diffusing liquors was 170°C.

P. B. Mithel, G. H. Webster and W. H. Rapson, University of Toronto, reported on their study of the action of water on cellulose fibers between the temperatures of 100° to 225°C. The results showed that no cellulose dissolved below 170°C. but 3 per cent dissolved at 209°C. Below 150°C. the alpha-cellulose content of the residue dropped only a little, but at higher temperatures it dropped quite sharply. The sharp drop was accompanied by a similar sharp rise in the beta-cellulose content and the pH values of the liquor changed from pH 6.1 at 160°C to pH 3.7 at 209°C.

The authors suggested that the rate of hydrolysis of cellulose is a function of the hydrogen ion concentration and the solubility of the shorter chain cellulose molecules is a function of the hydroxyl ion concentration. The authors further suggested that these reactions between cellulose and the aqueous solution are taking place in all cooking processes, and probably account for the differences which are found in the effects of acid, neutral, and alkaline cooking processes on celluloses. The curves may be used to estimate the extent of damage to be expected under any particular conditions of temperature and pH.

Paper making materials

J. W. Davis, W. H. Roberson, and C. A. Weisgerber, Hercules Powder, described the use of new sizing agents for paper — the alkylketene dimers. These alkylketene dimers react with the exposed hydroxyl groups on the fibers to form chemical bonds, giving rise to a very hard and permanent type of sizing. They require no alum and can be applied under either acid or alkaline conditions. The resistance of ketene dimers to strongly acid or alkaline penetrants and their effectiveness in the absence of alum should make them useful in the development of new grades of sized papers, the authors stated.

A. L. Magnuson and H. W. Bartlett, Kelco, discussed the use, based on field experiments, of Algin in board and liner manufacture. They presented a practical method for suspending pigments and other materials for application at the size press or calender stack to imrove finish, brightness, density, and printability in various board and liner grades.

In the coating field, evidence was presented to show that the incorporation of Algin results in better solid suspension, reduction of pigment flotation, control of binder migration into the web, and reduction of cost.

The wet end addition of Algin results in increased density and fines retention, higher printabilities, and improved strength characteristics.

Alkaline pulping

P. H. West reported on the efficiency of the venturi scrubber in chemical and heat recovery at Thilmany Paper Co. In the new 250-ton kraft recovery unit a venturi scrubber, using concentrated black liquor as the scrubbing medium, is used to recover both chemical and heat from the stack gases. The unit has been in operation since May, 1953, and shows a chemicals collection efficiency of approximately 90 percent and has resulted in considerable steam saving as indicated by more than conventional lowering of exit flue gas temperature. It has required virtually no maintenance since its installation.

Discussing the mechanism of sulfate pulping, G. R. Kulkarni and W. J. Nolan, Florida University, presented data and evidence by way of phloroglucinol-stained photomicrographs to show that the pulping reaction is accomplished by the movement of a reaction interface which travels toward the chip center, and that the thickness of this reaction area, in which most of the delignification occurs, is relatively narrow. These observations, the authors stated, were found to be true for blocks which had been pre-evacuated before cooking as well as for blocks which were cooked without pretreatment.

Plastics-paper combinations

Wilson F. Brown, Florida University, discussed the use of polyamide resin in coated papers which resisted the penetration of peanut oil for a minimum of 1000 hours at 73°F. and 50% r. h. The water vapor transmission rate of the coated paper increased with increasing amounts of methyl cellulose which was used as a thickening agent. It was, however, necessary to use small quantities of methyl cellulose in order to obtain a

Papermaking Materials: F. S. Klein, Byron Weston Co., Chairman; A. L. Magnuson, Kelco, is discussing the role of algins; and A. B. Gorham, Ontario Paper Co., spoke on dirt removal by centri-cleaners.

good coated sheet, the author stated.

Speaking on the physical properties of papers from synthetic fibers, such as Orlon, Dacron, and Nylon, that gave tenacities ranging from 22-33 lbs. per inch, elongation from 6-53 per cent, tear strength from 298-1228 grams, bursting strengths from 67 to 270 psi, and fold endurance from 51,000-1,000,000 cycles, James K. Hubbard, Franklin H. Koontz, and Robert A. A. Hentchel, E. I. du Pont de Nemours & Co., further disclosed that Nylon papers can be sewn to give seam strength of 40 to 100 per cent of the basis strength of the paper.

The critical step in the preparation of these papers is the bonding of the fibers to one another, and this is accomplished with calcium bromide, lithium bromide, calcium thiocyanate, Geon 576, or specially formulated polyamide and polyester adhesives.

Packaging materials

The seven papers read at this section were devoted to problems of protecting food and other packaged items from insects.

It was reported that 9 to 12 months protection had been achieved with multi-walled paper bags which had received a pyrethrum treatment on the outside ply, and complete resistance to all insects employed in the tests was reported with pyrenone treated multi-wall bags. It is believed that the effect of pyrenone is largely due to its insect repellent rather than its lethal action.

Maine, Syracuse Alumni Meet During Paper Week; Honor Award to Patch

CLIFFORD PATCH, technical director for Eastern Corp. at Bangor, Maine, was the recipient of the 1955 Honor Award of the University of Maine Pulp and Paper Foundation. The presentation was made at the annual luncheon of Maine pulp and paper alumni at the Bowman Room of the Biltmore Hotel.

Graduates of the New York State College of Forestry also gathered during the APPA and Tappi conventions for their annual reunion. The luncheon was staged at the Yale Club.

More than 150 Maine alumni were on hand to honor Mr. Patch. The citation given with the award read in part: "Presented to Clifford Patch in recognition of his accomplishments in the paper industry and devoted service to the university. His friendly personality and long years of fruitful research have won for him a warm place in the hearts of his associates."

Mr. Patch was graduated from Maine in 1911 with a B. S. degree in chemical engineering. In that year he became chief chemist at Orono Pulp & Paper Co. in Orono, Maine. He joined Eastern in 1930. The presentation was made by Wallace E. Parsons, president of Keyes Fibre Co., who is vice president of the U. of M. Pulp and Paper Foundation.

Maine University Luncheon: Robert Nelson, Chairman; Martin J. McHale, Luncheon Speaker; and Wallace Parsons, Vice President of U. of M. Pulp and Paper Foundation.

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Problems of an expanding and changing industry covered in New York meetings

That paper industry production will continue to grow for at least the next six months was the universal expectation expressed at the annual convention of the American Paper and Pulp Association and its affiliated organizations.

It became known officially that production in 1954 reached an all-time peak. That present high ratios of output will continue for months to come was the general belief.

The only cloud on the horizon is the fear of prolonged and costly strikes in the automotive industry, with the letters GAW as a stop sign for all industry. GAW is the short phrasing of Guaranteed Annual Wage, which is the announced objective for 1955 of the automobile unions. Negotiations will begin this spring, and there will be considerable jockeying for position for some weeks, with a possible crisis about the middle of the year.

If the manufacturers stand out against GAW and the unions decide to strike to attain this objective, a business slump is certain. The impact of a strike in motors will have its impact on other industry, from steel through the gamut, either directly or by the development of a fear psychology in the public mind.

Prospect of continued good business

For the first six months, however, production records are expected to be broken month by month, in comparison with output records for comparable months in other years. At the moment, the paper industry is experiencing the most satisfactory business in history with no prospect of slackening except by influences outside itself.

This prospect of continuing good business was manifested in addresses by representatives of all parts of the industry. Some of the highlights of Convention Week can be expressed statistically in this compendium of analyses by various speakers:

Production of paper and paperboard increased 38 per cent in the last seven years, or at an average rate for those years of 5 per cent annually. The value of paper mill securities in those years, as measured by prices in Wall Street and other securities markets, has practically doubled in that period. Profits have been proportionately increased. The great increase in production, due to larger machine capacity, has been concentrated in the southern field, with some outstanding expansions in some northerly areas. The South has come into its own with the developed utilization of the southern pine.

Possibly the most significant side of the southward trend of the industry has been the swinging of the pendulum of newsprint production. Increasing demand and high freight rates have resulted in the building up of newsprint production in the South, largely by newspaper customer participation in the financing of important new enterprises. An announcement during recent weeks of plans for a new newsprint mill in the South through industry expansion instead of through customer participation is perhaps the most notable evidence of a swing in the production picture. Such developments have been a material part of the statistical picture of tonnage production increases.

Optimism as seldom seen

It was such discussions as this, both in Association meetings and in hotel lobbies, that marked Convention Week, the optimism displayed being such as has seldom been seen in any major industry gathering.

Group meetings throughout the week discussed segment problems, and the high spot of the week was the open industry meeting on Wednesday. This meeting was unique in that it brought into the open questions which are to some extent debatable within the industry. That this was the case was made clear when Donald S. Leslie, president of APPA, at the close of the meeting pointed out that proposals made were not presented as statements in behalf of the industry, but individual proposals of the prominent speakers. He pointed out that at an open forum such proposals were welcomed, as in the democratic process it is the right of every person to express his views.

That the open meeting, as a forum in which representative manufacturers can be asked to outline objectives for the consideration of the entire industry, is achieving a new position of importance in Convention Week proceedings became evident.

Two speakers presented proposals for the consideration of the industry. J. D. Zellerbach, head of Crown Zellerbach Corp., one of the world's great paper companies, urged the industry to consider the national advantage of lowering tariff barriers against the importation of foreign goods. He said that a bulwark against communism is the development of industrial prosperity in foreign lands, which must be enabled to sell in the United States market, if they are to buy American exports. Mr. Leslie called attention to the fact that the industry had formally expressed its support of the so-called Randall Commission recommendations, of which pending legislation in Congress forms only a part.

Some internal improvements needed

Walter C. Shorter, vice president of Camp Mfg. Co., presented some striking suggestions for improvement in the APPA's corporate structure and operations. He said that the Association has been a development throughout the years with constant changes as industry conditions developed, and believed that a new orientation of the divisional structure of organizations representing special segments of the industry could well be studied. He also suggested new and, he believed, more effective methods of collecting industry statistics. On these proposals Mr. Leslie commented that the industry is already studying problems such as those outlined by Mr. Shorter, and that it was of value to the industry to have concrete proposals brought before the Association.

It was on these notes of industry optimism and an industry desire for continued progress in every form of its operation that the parent and group associations devoted their week of intensive analysis of the industry's present and its hopes for future development.

APPA holds 78th annual meeting on note of optimism

RIDING THE CREST of record production, executives of the United States pulp and paper industry met February 21-24 at New York's Waldorf-Astoria Hotel. Although a hint of caution pervaded the mammoth gathering, the 78th annual convention of the American Paper & Pulp Association demonstrated an optimism for the future.

The confidence in the coming months and years took the form of the cautious optimism that has since the end of World War II brought such tremendous expansion in pulp and paper capacity.

That expansion will by no means cease. On this glimpse into the crystal ball everyone agreed. And the association as a spokesman for the industry saw 1954's record-breaking production doubling in the next decade.

During the first postwar year production of paper and paperboard totaled 19,278,000 tons. In 1953, the industry broke all previous records with an output of 26,528,000 tons. And last year that effort boomed to an estimated 26,657,000 tons.

E. W. Tinker, executive secretary of APPA, believes there is no reason to stop at that figure. In an address before the annual meeting of the Salesmen's Association of the Paper Industry he declared that, "On the basis of the forestry programs that are being initiated by the industry in both Canada and the United States, I think that I am safe in saying that our output over the next decade can be doubled."

Principal speakers gather prior to the "Industry Speaks" session during the APPA convention. They are (l to r): Walter C. Shorter of Camp Mfg. Co.; J. B. Faegre of Minnesota & Ontario Paper Co.; Donald S. Leslie of Hammermill Paper Co., APPA president, and J. D. Zellerbach of Crown Zellerbach Corp.

▶ Record-breaking production cheers delegates to large gathering . . . Zellerbach urges a reversal in association's tariff policy . . . Output over the next decade may double

▶ Donald S. Leslie steps into APPA presidency for second term . . . Sees a good future for all facets of the industry . . . Affiliated groups meet to discuss problems and to elect leadership

Leslie Named to Second Term

A highlight of the convention was the election of Donald S. Leslie to his second term as APPA president. Mr. Leslie is president of Hammermill Paper Co. Named first vice president for the second year was Reuben B. Robertson Jr. of Champion Paper & Fibre Co.

Zellerbach Urges Tariff Reverse

The APPA was urged to reverse its traditional protectionist tariff policy by J. D. Zellerbach at the annual open industry meeting. Mr. Zellerbach, who is president of Crown Zellerbach Corp., declared that tariffs that prevent friendly nations from selling more in the world's largest market "undercut" American foreign policy.

Other speakers at the "Industry Speaks" session at the Starlight Roof of the Waldorf included Walter C. Shorter, vice president of Camp Mfg. Co.; J. B. Faegre, president of Minnesota & Ontario Paper Co., and Donald S. Leslie of Hammermill, APPA president. Presiding at the annual meeting where the industry "lets its hair down" was Reuben B. Robertson Jr. of Champion, the APPA's first vice president.

Describing himself as a "former protectionist," Mr. Zellerbach strongly supported President Eisenhower's trade program as sound foreign policy. The speaker, who was chief of the Economic Cooperation Administration mission to Italy during 1948-50, asserted that freer trade is essential to the joint economic strength of the free world. It is one of the important factors, he continued, in successfully checking the threat of Communist domination.

Not only are the President's recommendations sound foreign policy, Mr. Zellerbach explained, they are also good for the pulp and paper industry. Present trade restrictions, he added, are aiding the Iron Curtain countries and preventing allies of the United States from utilizing their full economic resources.

The speaker declared that Japan's position in world affairs is of vital importance to the welfare of the United States. He warned that unless trade barriers are reduced, that country may slip "into the Com-

Always popular on the APPA agenda during the New York convention is the Industry Speaks session at the Starlight Roof of the Waldorf. Addressing an intent audience at this year's gathering is Walter C. Shorter of Camp Mfg. Co., who spoke on the growth and needs of the Association

munist orbit." "We must open our market to Japan or risk the greatest industrial nation in Asia falling into the influence of Asiatic Communism, he said.

Mr. Zellerbach concluded with the observation that a substantial part of our trade restrictions are unjustified and economically wasteful. "On the one hand," he said, "we urge our allies . . . to develop greater economic strength so they can stabilize their governments against internal Communist subversion and contribute more men and weapons to the common defense against external Communist aggression; on the other hand, we maintain trade restrictions which handicap our allies in developing the very economic strength we are urging on them."

One of the Big Years

That 1955 will be "one of the really big years in the paper industry" was the view expressed by Mr. Leslie in his annual report as APPA president. Speaking at the "Industry Speaks" session, he emphasized four points:

1. The substantial growth during the past year of foreign markets for the U. S. pulp and paper industry;

2. A new high for domestic production;

3. Long-range predictions and planning for domestic production and consumption in 1960 and 1975,

4. Large-scale efforts by the industry to disseminate information to the public, to schools and to colleges about the paper and pulp field as a vital part of the national economy.

Showing the greatest interest in its history in developing foregin markets, the industry last year exported more pulp than it imported, the speaker continued. Never before had the United States experienced such a favorable condition in its foreign pulp market.

Pulp exports in 1954 were 431,000 tons, as against 375,000 tons of imports. Similarly, 1954 paper exports reached a record high of about 700,000 tons, nearly double the 372,000 of 1950.

Paper manufacture continues to be a growth industry, Mr. Leslie declared, not only in terms of production, but in importance to our national economy.

For the third time in four years, the industry broke a record when its output reached 26,657,000 tons. Expert opinion, he added, sees a 1955 production of 27,500,000 tons if the generally predicted high level of business activity is realized.

Following a discussion of Latin America and its important position in the pulp and paper industry and the APPA's desire to cooperate in developing production capacity "south of the border," Mr. Leslie looked ahead to 1960. He cited four studies of the steadily expanding production and consumption over the next five to 20 years: those of the Stanford Research Institute, the President's Materials Policy Committee, the Institute of Paper Chemistry, and the APPA.

The predictions vary. Stanford researchers see an output in 1975 of 46,600,000 tons. According to the APPA study (based on a 310-day production year), output in 1960 will be 32,000,000 tons. This forecast, he added, is conservative.

However, "a projected increased production of approximately 5,500,000 tons over a period of five years," Mr. Leslie concluded, "holds forth the promise of high operating ratios during that period."

New Highs for Wood Pulp

Output and consumption of wood pulp are expected to reach new highs, according to James L. Ritchie, executive director of the United States Pulp Producers Association. New pulp supply last year in the United States totaled 19,953,000 tons, he said. This was 2.2 per cent higher than in 1953 and a new record.

Addressing the annual session of the USPPA which is held in conjunction with the APPA meeting, Mr. Ritchie reported that 1954 domestic production was 18,341,000 tons, a gain of 4.6 per cent over the previous year. At the same time, he added, imports decreased while exports made a sharp and significant gain.

World Market Demand Higher

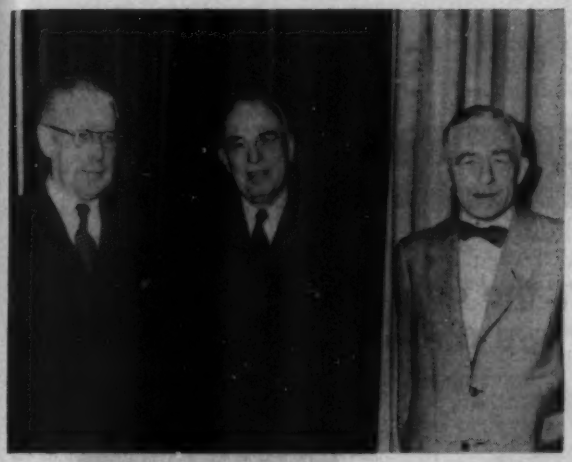
Although economic optimism in Europe (particularly western Germany and England) threatens to get out of hand, the future for world demand for U. S. pulp seems to be very favorable and economically sound. This was the view expressed by Reed R. Porter, executive secretary of the Association of Pulp Consumers.

Addressing the APC's annual gathering, Mr. Porter warned that European consumers are buying recklessly, with production facilities stretched to the limit. "This type of psychology," he said, "could easily have unfavorable repercussions on our pulp markets unless North American producers exercise intelligence and judgment."

Good Future for Fine Paper

There is every reason to expect that fine paper production this year will be 3 to 4 per cent higher than in 1954, thereby achieving a new output record, according to M. C. Dobrow, executive secretary of the Writing Paper Manufacturers Association.

Reporting to the 94th annual meet-



Hammermill Paper can be proud of its long history of APPA support, as represented here by Donald S. Leslie (l), present association president, and Norman W. Wilson (c), who served in the office in 1925-27. With them is E. W. Tinker, APPA executive-secretary. Picture was made during the Industry Speaks meeting

Discussing the future of the American Paper & Pulp Association here are two present officers and a past president. They are (l to r) George Olmstead Jr. of S. D. Warren Co., APPA president in 1950-52; Donald S. Leslie, present president, and Reuben B. Robertson Jr., first vice president

ing of the WPMA, the nation's oldest trade association, Mr. Dobrow predicted that 1954 fine paper production would be 1,324,000 tons, 2 per cent higher than in 1953, but still below 1951's record of 1,366,425 tons. He noted that since 1951 his segment of the industry has suffered a setback, largely because of the sharp decline in government requirements and a definite reduction of government inventories. This reduction, he declared, has gone about as far as it can go, while "the commercial demand has continued to grow and has almost completely offset the loss from reduced government requirements."

Mr. Dobrow revealed that since the first of the year new orders have been about 10 per cent higher than a year ago. Production has been stepped up to meet that demand. "For the first six months of this year, the outlook for general business is good," the speaker concluded. "The last six months will depend on many factors. . . .The continued growth of our population in the current decade has been a major force in making the transition from a wartime to a peacetime economy a relatively painless one."

Esprit de Corps

The APPA as a dominant influence in good public and industrial relations was praised by J. B. Faegre, president of Mando, in his talk before the association's popular "Industry Speaks" meeting.

He stressed the importance of cohesiveness or "esprit de corps" in American business, particularly in the paper industry. He cited the action of the APPA in operating "a very effective national clearing house to implement the exchange of ideas and community relations experience—both good and bad—between regions, their people and the groups who make our industry grow."

Officers elected to APPA affiliated groups and divisional associations during the New York convention are listed on page 1248 of this issue.

Mr. Faegre urged a "two-way communications system" between the legislative activities of the federal government and the individual enterprises of the paper industry and cited the APPA as the "logical medium for synthesizing the collective viewpoint of the industry."

Discussing the industry's obligation to the community, Mr. Faegre cautioned that the day of "cutting out" an area and moving elsewhere is gone. The paper manufacturer, he said, must manage his resources on an imperpetuity basis. "He must develop the community and learn to live in it as a good citizen. Conversely, the community which depends so vitally on the well-being of the company has its obligations, and the commingling of these forces demands statesmanship and understanding on both sides."

The role played by the APPA in the tremendous expansion of the industry deserves much of the credit in making that expansion as successful as it has been. "Do you suppose for a moment that we as individuals could possibly have presented fairly and completely the story of the inherent stability of the paper industry," Mr. Faegre asked; "that independently of one another we could have provided appropriate factual information on the basic economy of our industry in relation to industry as a whole; or that we could have persuaded the investing public that we were highly eligible for consideration as a 'blue chip' group?

"Much of the credit over the years should properly be given to the association, its singleness of purpose, and its broad objectives. Much should be given to the many thousands of industry representatives who have devoted so much time and conscientious effort in working for the good of the whole. But mostly, it seems to me, our great achievements come from the old 'barn building' spirit which made this country what it is and with which this industry is so well endowed."

A House in Order

The paper industry as the fifth largest industry in the United States must "have its house in order" before and in anticipation of a ntional emergency, Walter C. Shorter of Camp Mfg. Co. told the gathering at the Starlight Roof.

Calling on the APPA to continue its enlightened leadership for the benefit of the industry, Mr. Shorter advocated unification of the APPA and the National Paperboard Association, or —as a minimum—development of a much closer working liaison with NPA.

The speaker also recommended the establishment of a central group within APPA for the compilation of statistics. This, he said, would avoid the varying bases used by affiliated organizations and make such statistics standard and of more use to the industry as a whole. Cards from the individ-

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ual mills could be processed by the central group, he said, thereby achieving much greater accuracy and flexibility than is now possible.

Exports: General Optimism

At the annual meeting of the APPA Export Committee, four experts in the field of foreign trade painted a generally optimistic picture of the future. Because of the generally rapid improvement in living standards, Africa and South America seem to hold much promise for market development.

Since neither South America nor Africa have set traditions and because both regions attempt to imitate the U. S. in almost all respects, these two great continents are well worth the attention of the paper industry, according to J. P. Schwede, manager of export sales for Union Bag & Paper Corp. Two barriers exist, he continued, in developing these markets. In the case of Africa, that barrier is distance; in the case of South America, language.

The key to the problem is to bring about increased consumption, to create a market, the speaker concluded. It is doubtful whether any local production will satisfy the growing need, he explained, and the basic economic factors are favorable.

The future of pulp and paper export is "lively and healthy," according to Rex Vincent of Bulkley, Dunton Pulp Co. Inc. American manufacturers, he said, are now giving serious consideration to exporting pulp as an objective—and not as a means of merely disposing of surplus beyond the demands of the home market.

Mr. Vincent warned that currency changes and fluctuations are the only foreseeable causes of a reverse in the steady increase of pulp and paper exports.

That Europe is not a spot-tonnage market but firm and for the most part economically sound was the view expressed by N. C. Nelson, manager of the foreign sales division of Brown Co. He said that Europe as a whole is well worth keeping under close surveillance.

Concluding the meeting of the APPA Export Committee was Grant Richardson, manager of sales for Hammermill Paper Co. Along with a discussion of trade and political conditions in the Far East, he emphasized the position of exports as a top management problem.

Objective: Tree Improvement

Three genetic variations that can be utilized for forest tree improvement were outlined at the APPA Forest Policy Committee meeting by Ernest J. Schreiner, forest geneticist at the Northeastern Forest Experiment Station of the U. S. Forest Service.

These methods are: (1) selection of the races that are inherently best adapted to a particular region; (2) selection of inherently superior individual trees as seed trees for natural regeneration and as parent trees in special seed orchards, and (3) mass production of hybrids between selected races or species in combinations proved to produce superior hybrid progenies.

Mr. Schreiner stressed forest tree improvement as the "most appropriate practical objective of forest genetics."

New Products, New Needs

The fast-developing paper industry is creating new problems as it rolls along in its never-ending product expansion. As a new paper product or a new paper grade is developed, new needs are created.

At a gathering of the APPA Materials Committee, three speakers representing various facets of production emphasized that every new development brings about the necessity for change. In a talk, "Adhesive Trends in the Paper Industry," Dr. T. A. White showed the changes in adhesives and methods of application over the last quarter century. Twenty-five years ago, he said, the paper industry was but half as large as it is today. Product varieties were few. And adhesives and their application were simple.

However, with the depression came the development of more mechanical ways of application, he continued, and the need for fast-drying adhesives. World War II followed with strict requirements for packaging, the use of resins, and the use of multiwall paper bags, solid fiber containers, etc.

Dr. White, who is chief chemist for National Starch Products Inc., declared that the paper industry is now in a transition from the old-type (natural) adhesives to the new synthetics. The older varieties, he declared, are not found to be successful with fast packaging equipment, with resin-coated products or with laminates. New packaging, new coatings and new laminations, he declared, are bringing about a new need—a need for the plastic adhesive types.

Following Dr. White, Allan Hyer, vice president of the Black-Clawson Co., discussed "Automation in Paper Mill Machinery." The paper industry, he said, is ahead in the field of automation. In the past 50 years, he explained, the paper industry has increased its output five times, while that of the nation as a whole was only doubling. Automation played an important role.

Mr. Hyer noted that automation is neither new nor revolutionary. Labor is not displaced, it is relocated with upgraded skills as a by-product. The speaker explained that a labor-saving device makes more jobs—in maintenance, in technological laboratories, in sales and service.

Steps in automation in the paper industry were outlined by Mr. Hyer, who noted that the first great advance was the development of the fourdrinier, which perhaps represented a more profound advance in labor-saving than any one other single development. The first World War added important steps in the process. And in the years since World War II the industry is experiencing its greatest boom in respect to creating automatic equipment: new cutting methods, wood handling equipment, barkers, chippers, digesters, conveyors, air and hydraulic controls.

An extensive description of the latest developments in inventory cataloging and controls highlighted the talk presented at the Materials Committee meeting by C. C. Cormicle, director of commodity classification services for Remington-Rand Inc. He showed the tremendous savings possible through the use of scientific methods for inventory control in large firms that maintain several hundred thousand dollars of equipment and parts on hand at all times. Locating needed items and recording their use makes possible a constantly up-to-the-minute record of a firm's inventory. Reducing the man-hours which normally must be devoted to such activities can play a major role in reducing expenditures. Modern machine methods are making that goal possible.

Water Resources Vital

That problems of water resources equal in importance those of forest and other resources was the view expressed by George E. Dyke at the annual board of governors meeting of the National Council for Stream Improvement.

Mr. Dyke, who is chairman of the board, recommended the establishment of a "sound national water resources policy." He said that with the predicted tremendous growth of pulp and paper production there will naturally be growing problems of water supply and of stream pollution. "It is generally to our industry's advantage," Mr. Dyke declared, "that every effort be made to conserve available water resources and develop new supplies through the adoption of a

Appleton Twins For Dual Economy

A new Appleton supercalender to increase production. A modern Appleton rewinder for more speed. Team them up for *twice* the efficiency to cope with today's higher costs.

Appleton supercalender illustrated: 150″ 12 roll, has shaftless unwind arrangement and automatic roll handling from elevated storage platform. Operates at 1800 f.p.m.

Appleton rewinder illustrated: 150″ 2 drum, also ruggedly built, with low center of gravity to assure vibration-free operation. Operates at 3500 f.p.m.

APPLETON MACHINE COMPANY
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CUSTOM BUILDERS OF PULP, PAPER & TEXTILE MACHINERY · CALENDERS · FINISHING ROLLS · REWINDERS · SCREENS · DECKERS

sound national water resources policy."

During the National Council's annual gathering, regional chairmen were told that the pulp and paper industry has spent 70,000,000 on waste treatment plant construction. Dr. Harry W. Gehm, the Council's technical advisor, presented a series of slides showing 25 waste treatment plants in the pulp and paper industry. Such plants, he said, represent almost every method of treatment known to science.

By 1975, Carl G. Paulsen told the meeting, U. S. water requirements will total 350 billion gallons daily, with industrial users accounting for two-thirds of the total. Mr. Paulsen, who is chief of the Division of Water Resources of the U. S. Geological Survey, disclosed that his agency is preparing a series of reports on the quantitative and qualitative water requirements of selected industries, and that reports on the pulp and paper industry are in preparation.

William A. Selke of Columbia University discussed the possible use of nuclear fission wastes for treating certain types of pulping wastes. He pointed out that nuclear radiation is capable of destroying certain organic compounds potentially toxic to aquatic life.

Word Trade a Major Theme

"This past year the American paper industry has shown a greater interest in developing foreign markets than ever before in its history," E. W. Tinker said in outlining the general theme of the APPA gathering. "During 1954, the industry for the first time exported more pulp than it imported from overseas, and our paper exports reached a new record high."

Mr. Tinker, who is APPA executive secretary, called 1954 "a record year all the way through for the paper and pulp industry . . . Last year's production and export figures confirmed the steady growth of the industry at home and abroad."

Fringe Benefits Extensive

About 20.7 per cent of the paper industry's yearly labor costs go into fringe benefits of one kind or another, the Writing Paper Manufacturers Association was told at its annual gathering. Speaker at the meeting was E. G. Amos, chairman of the APPA Industrial Relations Committee.

The figure, he said, was obtained through a survey of 19 leading firms of various types in the paper and pulp field. Percentages varied from a low of 15.4 to a high of 31.3.

In his report, Mr. Amos broke down employee remuneration as follows: straight time hourly wages, 79 per cent; overtime pay, 6.6; pensions, insurance, hospitalization and similar benefits, 4.88; paid vacations, sick leave, scheduled rest periods and the like, 5.3, and Christmas bonuses and profit sharing, 0.98 per cent.

Employee remuneration other than straight time pay amounted to an average of 43 cents an hour, Mr. Amos continued, though here too the figure, as far as individual companies were concerned, varied from 30 to 72 cents an hour.

Similarly, the over-all cost per employee varied from $3828 to $5690 per year, averaging $4616. Costs other than straight time pay varied from $600 to $1800 per year, averaging $956.

A High Standard

A high standard of performance has been established by representatives of the paper industry who have served the government in various capacities, according to Russell C. Flom, assistant administrator of the Business and Defense Services Administration in the U. S. Department of Commerce.

These men, he declared, have built for the industry a fine reputation, and the result has been that the industry is highly thought of for the cooperation it has shown to government activities.

Mr. Flom, who is on leave as director of sales for Marathon Corp., lauded the changed atmosphere in which industry finds itself in Washington. "Instead of the old condescending attitude toward business," he said, "there is developing an approach toward the interests and ideas of the businessmen of the country that almost reaches to the point of asking 'what suggestions can business give to help do a better job in government.'"

New SAPI president meets with representatives of Tappi at the Salesmen's annual luncheon. The new proxy is L. E. Graham of International (1). The others are George H. Pringle, retiring Tappi president, and R. G. MacDonald, secretary-treasurer of Tappi

Europe's Great Paper Need Outlined At SAPI Meeting by Ticoulat

AN IMMENSE DEMAND for paper and pulp is devolping in Europe, and only the North American industry can satisfy it. This was the view expressed by G. J. Ticoulat, vice president of Crown Zellerbach Corp., as he addressed the 36th annual luncheon of the Salesmen's Association of the Paper Industry. The gathering was held in the Waldorf-Astoria Hotel.

"There is no possibility at present that the Scandinavian countries will be able to increase capacity to satisfy

(Continued on page 1224)

Plant of Southern Paperboard Corporation, where a $5,000,000 mill expansion program was recently completed

High yield expansion at Southern Paperboard

THE HIGH YIELD $5,000,000 expansion program of Southern Paperboard Corp. at Port Wentworth, Ga. —authorized in November 1951—has increased mill production from the original design capacity of 450 tons to an average of 625 tons daily; or a maximum capacity of 685 tons per day of finished board. Southern Paperboard is a subsidiary of Robert Gair Co. Inc., manufacturer of paperboard, folding cartons, and shipping containers.

"The Southern Paperboard Corp. Mill," said George E. Dyke, president of the company, "is a typical example of the recent great strides made in the technology of the production of kraft board resulting in important improvements in quality and uniformity, in better utilization of pulp wood, and in higher production rates. When completed in June 1948 at a cost of approximately $16,700,000, this mill included the most up-to-date methods and equipment available at that time. Yet scarcely four years later, in order to take full advantage of the advance in techniques and to make other improvements, this extension program was entered into."

The installation of the new equipment involved, and the tying into present units, was accomplished with a minimum of lost time, as tie-ins were skillfully scheduled to be made at usual holiday shutdowns.

Wood preparation

A check of the existing wood handling and wood preparation equipment revealed that no additions were required, since the expected high-yield pulp production would provide sufficient furnish for the increase in finished product. The chip storage and handling facilities were also adequate for serving the new digesters.

Causticizing

To supplement the existing causticizing plant, a new lime storage bin was installed, this to be fed from a lime track unloading hopper, drag conveyor, and bucket elevator.

A new lime slaker, with new and reburned lime feeders, was provided outdoors adjacent to the present slaker building.

An additional lime mud storage tank with agitator and a white liquor storage tank were found necessary.

Digesters

A 29-ft. by 76-ft. extension was added to the digester building to house four new 3320-cu. ft. carbon steel digesters, each equipped with a gas-off separator and hydraulically controlled blow valve.

For feeding chips to the four new and the six old digesters, a new shuttle belt conveyor was installed centered over the digesters and hung from overhead tracks. The shuttle belt was fed from the old chip conveyor.

A new black liquor measuring tank was added for supplying charges of black liquor to both the new and old digesters.

Piping changes in the blow lines were made so that the old digesters isting blow tanks, and the new dicould be connected to one of the exgesters to the other present blow tank.

Washing and screening

To house the additional washers, screens, deckers, and refining equipment, the present wash and screen room was extended for a width of 57 ft., the length of the two rooms being approximately 155 ft.

Three 11-ft. 6-in. diameter by 16 ft. long vacuum washers with intermediate repulpers and final repulper were installed on the operating floor of the wash room, with space pro-

Six-effect Conkey evaporator unit equipped with barometric condenser, flash tanks, and liquor and condensate pumps

vided for a fourth future washer if desired. Three Claflins were placed ahead of these new washers.

Stock is being furnished from the existing pumps, which have been equipped with variable speed couplings.

To protect the Claflins, permanent type magnetic separators were supplied in the stock lines.

A 16-ft. diameter steel horizontal filtrate tank has been provided for each washing stage, with the necessary black liquor dilution pumps. The tanks are connected by foam lines to a 20-ft. diameter by 60 ft. high steel foam tower; the latter and strong black liquor filtrate tank each being equipped with a foam breaker.

This new washing equipment supplements the old four-stage, Line "A", 8-ft. diameter by 14-ft. washers and the three-stage, Line "B", 8-ft. by 10-ft. washers. The pre-knotters formerly used ahead of these washers have been bypassed, and stock conditioning is now being done by two Claflins for each line. These are also protected from tramp metal injury by permanent type pipeline magnets.

Over the new line of washers a hood has been installed, with fans for exhausting vapors to outdoors.

Stock from the new washers and the present Line "A" washers is normally to be discharged at high density (provision has also been made for low density storage to existing chests if desired). The H.D. stock is to be taken by a rubber belt conveyor to a 33-ft. diameter by 60-ft. high steel high density storage tank equipped with agitation and dilution equipment.

Between the washed stock storage tanks and screening equipment seven single-disc refiners, each driven by a 450-hp motor, have been installed. The consistency of the stock to these refiners will be controlled by pressure type regulators.

Four new centrifugal screens have been added to the eight present screens. The new screens are provided with agitated mix box, flow box, and poppet type inlet valves.

For thickening the screened stock and also to serve as savealls for the

New General Electric 10,000-kw turbo-generator at Southern's plant

Dorr-Oliver vacuum washer and Ross Engineering hood

paper white water, two 8-ft. diameter by 16-ft. vacuum deckers were purchased. The stock from these deckers is to be discharged into a new tile storage chest equipped with agitators. The white water from the savealls is to be collected in a tile chest and used for dilution water as required in the stock preparation system.

Rejects from the centrifugal screens are to be pumped over a drainer, then refined through an existing disc refiner of the same make prior to being returned to the centrifugal screens for further screening.

Paper machine

The following changes were necessary to the paper machine and auxiliaries:

The steam pressure to the dryers was increased to 70 psi; two additional vacuum pumps were provided for the couch roll; separators and condensate pumps were added for the dryer drainage system; additional agitator and stock pumps were furnished for the couch pit; and three exhaust fans added to the paper machine head. An additional supply fan was also required for makeup air.

Deculators have also been installed for deaerating stock to the primary and secondary head boxes.

Evaporators

A new six-effect self-supporting evaporating unit, equipped with barometric condenser, flash tanks, and liquor and condensate pumps, has been added to the present multiple effect black liquor evaporators.

In connection with the evaporator unit, a soap skimming tank, with skimmer, and a concentrated black liquor storage tank were required.

Power plant

To provide the additional steam required for the mill expansion a new 160,000-lb. per hour power boiler was added. This unit is equipped for either oil or gas firing, with provision for conversion to pulverized coal in the future.

Auxiliary boiler room equipment added to complete the boiler room expansion consisted of a boiler feed pump, makeup pumps, feed water heater, chemical feed pump, combustion and feed water controls.

To provide for the additional power required by the mill expansion, a new 10,000-kw maximum capacity turbo-generator was installed in the turbine room. This is a double automatic extraction, condensing machine equipped with a condenser and auxiliaries.

In addition, the existing turbo-generators were altered so that the non-condensing turbine exhausts at the condensing turbine extracts at 80 psi instead of the previous 50 psi. At the same time, the condensing turbine was altered to increase its maximum capacity from 6000 to 7500 kw.

General

The high yield expansion program was directed by C. S. Huestis, vice president of Southern Paperboard, in conjunction with the mill staff headed by Charles McCarthy, vice president, and assisted by Claude Adams, production manager, and Bruce Ellen, power and pulp mill superintendent.

J. E. Sirrine Co. of Greenville, S.C., was retained as engineers for the complete detailed design and supervision of construction.

The entire construction program was consummated by obtaining firm bids for the various portions of the work.

Suppliers of principal equipment at Port Wentworth

Agitation and dilution equipment	Improved Machinery Inc.
Boiler, Power	Combustion Engineering Inc.
Causticizing equipment	Dorr-Oliver Inc.
Chest, tile storage	Chemical Linings Inc.
Chutes (and misc. tanks)	Equitable Equipment Co.
Condenser, surface and auxiliaries	Westinghouse Electric Corp.
Conveyor, lime and causticizing equipment	Jeffrey Mfg. Co.
Conveyor, repulper	Improved Machinery Inc.
Conveyor, rubber belt for h. d. stock	Link-Belt Co.
Conveyor, shuttle belt for chips	Montague Machine Co.
Copper tubing	Samuel Moore & Co.
Couplings	Koppers Co.
Deckers, vacuum	Dorr-Oliver Inc.
Digesters	Chicago Bridge & Iron Co.
Digester blow valves	Paul Valve Corp.
Drainer	Sprout, Waldron & Co.
Evaporating unit (Conkey six-effect)	General American Transportation Co.
Fans, exhaust	James Olmen Co.
Foam breaker	Dorr-Oliver Inc.
Generator, turbine, and motors	General Electric Co.
Heater, closed feedmotor	Griscom-Russell Co.
Hood, washer and exhaust	J. O. Ross Engineering Corp.
Hopper, lime track unloading	Jeffery Mfg. Co.
Instruments	Foxboro Co.
Instruments & Controllers	Clark & Vicario
Oil Coolers	American Blower Corp.
Pre-breakers	Emerson Mfg. Co.
Pumps	Allis-Chalmers Mfg. Co.
Pumps, Liquor and condensate	Worthington Corp.
Pumps, condensate	Ross Midwest Fulton Corp.
Pumps, vacuum	Nash Engineering Co.
Pumps	Goulds Pumps Inc.
Pumps	Ingersoll-Rand Co.
Pumps, chemical	Milton Roy Co.
Pump, soap	Viking Pump Co.
Pumps, hot well	Westinghouse Electric Corp.
Regulators, consistency	DeZurik Shower Co.
Regulators, steam	Powers Regulator Co.
Regulator and control system for feedmotor	Republic Flow Meter Co.
Refiners, disk	Sprout, Waldron & Co.
Saveall	Dorr-Oliver Inc.
Screens, centrifugal	Improved Machinery Inc.
Separators	Ross Midwest Fulton Corp.
Skimmer	Link-Belt Co.
Separators	Ross Midwest Fulton Corp.
Tanks	Chicago Bridge & Iron Co.
Tanks, misc.	Cole Mfg. Co., R. D.
Valves	Greenville Steel & Foundry Co.
Valves, poppet	Improved Machinery Inc.
Washers, vacuum	Dorr-Oliver Inc.

A sample of employee attitude in the pulp and paper industry

AN ANALYSIS OF the papers submitted in the eighth annual Bolton Award contest, sponsored by John W. Bolton & Sons Co. of Lawrence, Mass., and conducted under the auspices of the American Pulp & Paper Mill Superintendents Association, discloses an interesting, perhaps an important, "trend to the right" on the part of wage earners. The subject of the eighth annual contest was, "The Obligations of an Employee to his Company," a logical sequel to the subject of the 1953 award—"The Obligation of a Company to its Employees."

Discounting the fact that the papers written by mill workers were for cash prizes in a competition held under the auspices of the Superintendents Association and the liability that this may have affected the reasoning and conclusions of contestants, the judges were deeply impressed by a pattern which emphasized ideas not commonly credited to wage earners:

- **Acceptance of a share of responsibility on the part of labor for future progress in better standards of living.**
- **A basic belief in free enterprise as the best method of operating industry and a corresponding rejection of Marxist theories.**
- **An understanding of fundamental economic factors involved and approval of the principle of capital investment, profit earnings, and dividend payments.**

These papers were written by mill workers scattered throughout the United States. The beliefs expressed, therefore, were not confined to any one geographical section, nor to a few organizations. The writers represented a wide range of occupations. How far their views coincide with those of workers in other industries is, of course, problematical, but in the opinion of the judges (outsiders selected for their backgrounds and editorial experience) the very fact that the papers disclosed a rather remarkable pattern of thinking was highly suggestive of a general trend in opinion.

Six main obligations

There were six main "obligations" emphasized in the essays which caused the judges to reach that conclusion:

Loyalty to the company, described by one writer as "the kind of loyalty that boosts the company instead of lowering it." Many contestants condemned such practices as "griping and complaining about the company" as contributing to bad repute in the community and being disheartening to other employees.

Greater Productivity. There were many references to the better standards of living being due to greater productivity by industry, and the use of modern methods and machines to produce high quality products in greater abundance. Some writers urged a "recognition of the mutual dependence of employer and employee;" others expressed the thought contained in a paper submitted by a machine tender: "Improvement in product goes hand in hand with the makings of a sound and dependable place of employment."

Teamwork. The value of cooperation was emphasized in many papers "for the attainment of greater production, lower costs, and worker satisfaction on the job." Many comments showed a sincere belief, based upon personal experience, in the importance of good relations and teamwork between employees themselves and between employees and foremen "which pay off in greater satisfaction on the job."

Safety. The papers reflected a general interest in management's efforts to make jobs safe, with the significant argument that "horseplay and disorderly conduct" were unsafe practices that might result in production loss, sloppy work and property destruction.

Union Activity. Of all the points emphasized, that of union activity seemed to demonstrate a new and broader line of thinking. It was expressed in this statement by one of the contestants: "The employee should take an active part in union affairs to see that his union secures a contract that is reasonable; one that gives him the best possible wage at the least possible cost to the company."

Dependability. This was featured particularly in papers submitted by shift workers on the paper machines, with special emphasis upon the need of attendance and punctuality. Lack of dependability was condemned not only for its effect upon fellow employees, but for its effect upon the company's capacity to produce.

Cost Consciousness. The papers revealed a surprising interest among wage earners in the subject of production costs. There were many references to the worker's responsibility for avoiding waste, and economical production to enable the company to engage in successful competition.

In general, the papers reflected a negative attitude against so-called "class warfare;" a rather astonishing interest in the economics of production, and a growing knowledge of economic and social problems.

Lignins and their uses*

EDUARD FARBER**

Experiments on recovery of chemicals from dilute solutions, such as are produced in industrial operations, by means of absorption on lignin, being conducted in the chemical laboratory of Timber Engineering Co., Washington, D. C. (Shown is Dr. Matthew Sciascia, senior chemist and assistant to Dr. Eduard Farber, chief chemist.)

FEW RESEARCH ACCOMPLISHMENTS in waste utilization equal in far-reaching and beneficial results those attained in the development of lignin, from a traditionally useless component of wood into a valuable source of useable products. This transformation not only is increasing the volume of useful material within the nation's forest resources, but is offering solutions to a waste disposal problem that has long plagued industrial wood-using plants.

A few decades ago lignin was the special subject of a very small group of scientific workers. In general, it was considered mainly as that non-cellulosic part of the wood that had to be removed in order to make pulp and paper—or cellulose and its chemical derivatives.

Small streams of lignin-containing solutions were running out of the sulfite pulp mills into the rivers, which could barely carry the load of such contamination. Solutions containing another lignin as a derivative from the natural product were made with alkalis in producing kraft pulp and paper; these solutions were concentrated, and the lignin materials were burned to recover the alkalis.

Shortly before World War I lignin began to be produced in a third form, not in solution but as a solid residue obtained after dissolving the cellulosic substances of wood in dilute mineral acids by cooking under pressure. More of this lignin as a solid residue became available after the war. All that could be done with it, at that time, was to burn it as fuel.

Scientists gradually intensified their probing into the chemical nature of lignin. Before they found a thorough answer to their problem, their experiments and speculations brought discoveries of physical and chemical properties which could be applied in practical, if partial, uses of the several types of lignin. Today, considerable quantities of one or the other type of lignin are used for their physical properties. For example, they are used as binding and emulsifying materials, or they are chemically converted by purification into tannins or by controlled partial oxidation into vanillin.

However, large tonnages of available lignins are still unused and, worse than that, they are permitted to be wasted into streams. The bad is often more impressive than the good. Since so much lignin is still being wasted, it is perhaps not surprising to see the thought still prevailing that we do not know the first thing about this great product of nature. Many people feel that we know cellulose because we are using it in millions of tons every year, but that we have not scratched the proverbial surface of lignin chemistry. The facts are a little different from this widespread impression. The science of lignin has made considerable progress, particularly in the last three decades, while on the other hand the scientific problems of cellulose are still very much in need of continued study. Efforts to utilize lignin in its various forms are very extensive and not at all unsuccessful. In the appendix is shown a selected number of patents that have been published during the last 10 or 15 years.

Chemical and physical properties of lignins

The use of the plural form, lignins, is justified by the differences existing between the substances of this group. The lignins in hardwoods are different from those in softwoods,, and within these two groups finer distinctions exist. Industrial operations furnish modified or derived lignins of several kinds.

Separation of lignin from cellulosic materials in wood:

A definition for the whole group of these lignins can best be reached by describing, in general terms, the operations used for separating the constituents of wood. These operations start with extractions under mild conditions. For the present purpose, extraction with water, then with organic solvents (alcohol, benzene, etc.) are carried out for relatively short periods of time. If they were extended for very long periods, they would not only remove the preformed soluble substances, they would attack and change the wood. This is a fundamental consideration.

In all our chemical work, and particularly with organic substances, results depend not only on the means, here solvents, but on the conditions, here time and temperature, we are using. Extraction with boiling water, extended over days, may bring more than half the substance of many kinds of wood into solution. What a too

*An exclusive contribution to THE PAPER INDUSTRY

**Dr. Farber, a prominent scientist of national recognition who is credited with many patents in lignin chemistry, is chief chemist for Timber Engineering Co., Washington, D. C.

vigorously conducted extraction with organic solvents like alcohols does to the wood will be mentioned later. Such extractions do not analyze, they modify the wood in a series of chemical changes.

The mildly extracted wood is then digested with concentrated sulfuric acid. This operation dissolves the carbohydrates consisting of cellulose and hemi-celluloses, leaving a solid residue which is lignin. The best degree of concentration in sulfuric acid varies somewhat for different species of wood; on an average, about 72 per cent concentrations of sulfuric acid are used. Care in selecting the temperature conditions has to be exercised here, and even with care the acid is "strong" enough to produce some side-reactions. For example, some small part of the acid attaches itself to the lignin even at room temperature. However, the chemical bond is weak, it can be broken by boiling with water.

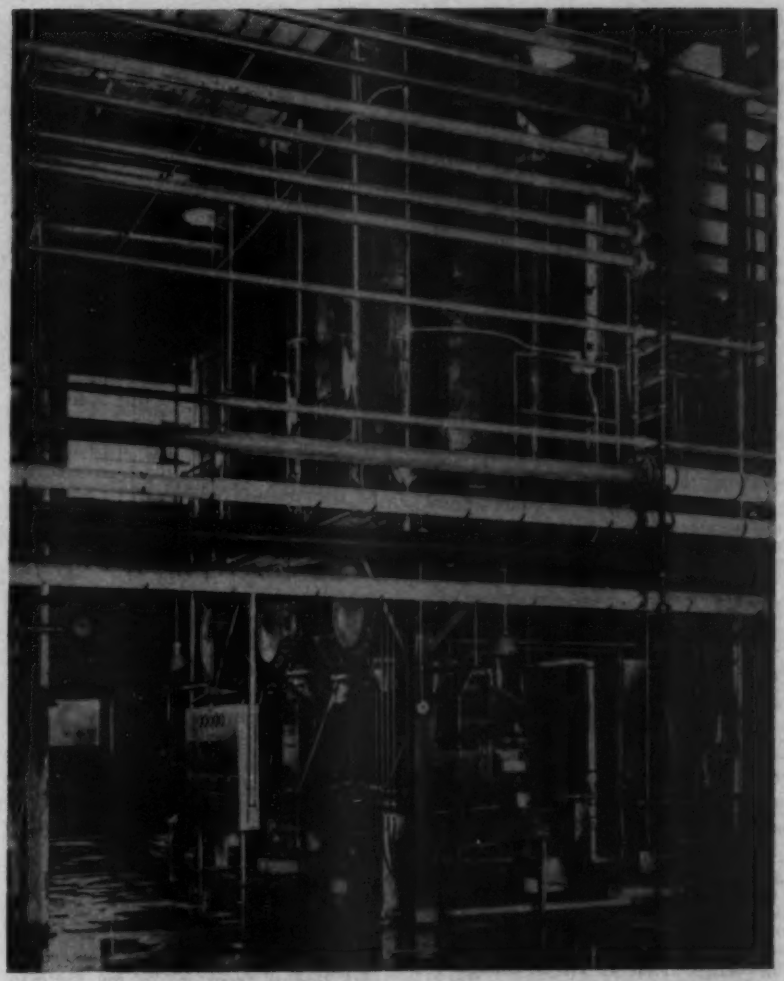
Instead of using concentrated acid at low temperatures, very dilute (less than 1 per cent) acid at high temperatures (up to 180° C) can be used for the separation. This is the basis for an industrial process in which the carbohydrates are dissolved by hydrolysis and the lignin is left as a solid residue.†

These two methods of hydrolysis, with cold concentrated acid or hot dilute acid, produce unnatural lignins, as can be observed by comparing them with lignins from considerably milder operations. Certain microorganisms attack the carbohydrates of wood, consume them as food and leave lignins that differ from those of hydrolysis in lighter color and greater chemical reactivity. These "natural" lignins are available from brown rot, and their chemical reactivity has been used to convert them into bonding agents, "glues," by reaction with formaldehyde.

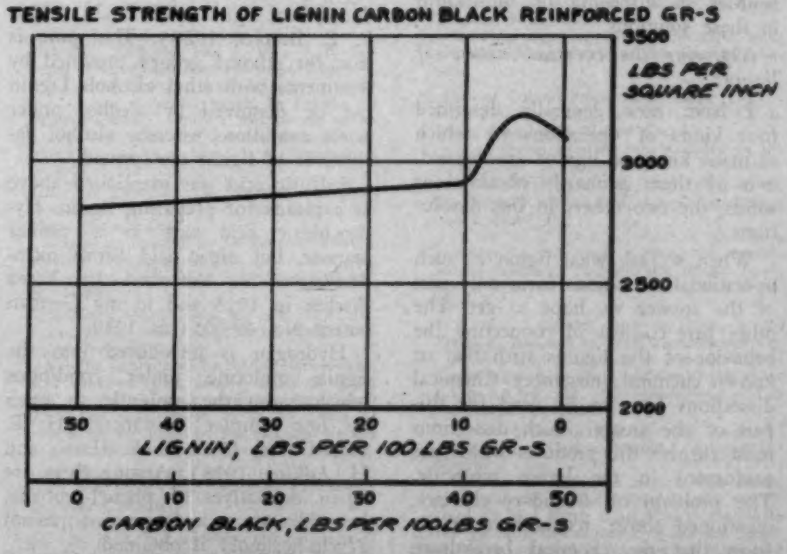
Another mild operation uses the ability of ammoniacal copper salt solutions to dissolve cellulose at low temperatures. This delicate method was adapted to this special problem by Karl Freudenberg (1929).

These details of operations for separating lignin are described here to bring out differences between the product obtained by different methods. Natural lignin is quite sensitive and subject to change under the assault of chemical agents. A practical conclusion from these experiences is that the methods used for obtaining lignin should be carefully selected when

†For a general survey of these relationships, see the author's article in *Wood*, December, 1946.



Triple effect evaporator, in which chemically treated sulfide lignin liquor is concentrated at Marathon Corp.'s chemical division in Rothschild, Wis.


TENSILE STRENGTH OF LIGNIN CARBON BLACK REINFORCED GR-S
3500
LBS PER SQUARE INCH
3000
2500
2000
50 40 30 20 10 0
LIGNIN, LBS PER 100 LBS GR-S
0 10 20 30 40 50
CARBON BLACK, LBS PER 100 LBS GR-S

Graph showing an exceptionally large increase in strength of a synthetic (GR-S) rubber when the usual carbon black filler is replaced by lignin in a certain range of proportions. (From: Arthur Pollack, U. S. Pat. 2,676,931, assigned to West Virginia Pulp & Paper Co.)

lignin is desired for further chemical conversion. A comparison with synthetic resins may help to make this situation still clearer. When phenol is combined with formaldehyde, the concentration of acids or alkalis and the timing at specified temperatures are closely regulated. If we were to use strong reagents without controls, we would not succeed in producing a useable resin. The future for a commercial utilization of the solid lignin residues may depend upon special attention to the conditions under which such lignin is made.

In all these methods, lignin is produced as a solid residue after dissolving the cellulosic substances. Industrially, the reverse is widely done. Because the desired main product is cellulose in the least degraded form, the methods aim at removing lignin by dissolving it, whether and in what way we change it chemically in the process is of secondary importance. The chemically active solvents are sulfites in solutions of their salts, mainly acidic solutions, or sodium hydroxide with addition of sulfides or sulfates.

Thus, sulfur in various stages of oxidation (sulfites and sulfates) or reduction (sulfide) is an important chemical in the cellulose industries. Sulfites enter into chemical combination with the lignin molecule and form ligno-sulfonic acid. Caustic alkalis convert the lignin into salts of lignin acids. Both are highly soluble in water. That is an advantage for separating the lignins, in the form of these derivatives, from the cellulose. Seen from a different angle, it also is the basis for some of the difficulties in disposing of the lignin in these solutions.

Exploring the chemical nature of lignin:

I have now generally described four kinds of operations by which as many kinds of lignins are defined, two of them primarily obtained as solids, the two others in liquid solutions.

When we ask what lignin is, such operational definitions form only part of the answer we hope to get. The other part consists in connecting the behavior of the lignins with that of known chemical substances. Chemical dissections have to be used for this part of the answer. Such dissections must furnish the products which are preformed in the lignin molecule. The problem of secondary changes, mentioned above, recurs here in the form that the chemical breakdown products must have a definite relationship to the original.

The mildest form of analysis uses the behavior of a substance towards light. Many chemicals absorb specific narrow regions of the light spectrum in characteristic manner. R. G. Herzog concluded from the ultraviolet absorption of lignin (1929) that it is related to a known extractive from wood, coniferin, and that the lignin molecule is basically a phenyl group, like that in phenol, combined with a propane group like that in propane gas. Peter Klason had come close to such thoughts many years before 1929, and Karl Freudenberg specified them still more at about the same time. The phenol part of the molecule contained an attached group, which is easily converted into methanol, a methoxyl group. Its place in relation to the phenolic hydroxyl group and to the propane part of the basic molecule was exactly determined.

This methoxyl group, CH_3-O-, (methanol is represented by CH_3-OH) is an important indicator in lignin research. Hardwood lignin contains more of it than softwood lignin. This causes the high methanol yield in hardwood distillation. It is furthermore the reason for a specific color reaction. Treated with chlorine and then sodium bisulfite, deciduous woods turn red, coniferous woods brown.

The methoxyl groups in lignin announce their presence in other reactions too. Lignin reacts with chlorine. This is the basis for bleaching cellulose, that is, for demoving residual lignins from it. In my German patent, No. 484,167 of 1929, I disclosed that methanol is set free when lignin is chlorinated. On the other hand, more methoxyl can be introduced into lignin (W. Fuchs, 1929; F. E. Brauns, 1938). The same is true for ethoxyl groups provided by treatments with ethyl alcohol. Lignin can be dissolved by alcohol under acidic conditions whereby alcohol derivatives of lignin are formed.

Sulfuric acid was mentioned above as a means for preparing lignin. Hydrochloric acid acts in a similar manner, but nitric acid forms nitro-derivatives as described by Franz Fischer in 1923 and in my German patent No. 493,054 of 1930.

Hydrogen is introduced into the lignin molecule under conditions which cause the molecule to open up into simpler substances (H. E. Fierz-David, 1925; E. E. Harris and H. Adkins, 1938). Among them are again derivatives of phenyl-propane. In addition, a hydrogenated phenol (cyclo-hexanol) is obtained.

With oxygen, part of the lignin can be converted into vanillin (K. Kurschner, 1924). Mild conditions can be used for this conversion, so that it indicates that a part of the lignin structure is actually close to the known structure of vanillin. Ligno-sulfonic acids from softwoods, which have been the object of much thorough study (E. Hägglund and others) furnish vanillin in relatively high yields. The corresponding products from hardwood lignins have been investigated. H. Hibbert developed the hydrogenation method into a tool for characterizing the lignins from many species of wood.

From all such reactions the picture of the lignin molecules emerges quite clearly. The final test in such work is the synthesis from known materials in controlled steps. Such a synthesis is the more difficult since lignin consists of packages of simpler been used. (F. F. Nord, K. Freudenberg) to bring us very close to this goal.

Thus, lignins are complex substances containing methoxyl and hydroxyl groups in phenylpropane molecules variously linked together and capable of reacting with hydrogen, chlorine, oxygen, nitric acid, sulfuric acid, and alkalis.

Uses of lignins

For some groups of uses, knowledge of the chemical constitution of lignin was not necessary. Sulfite waste liquors, the solutions of sulfonic acid derivatives obtained in cooking wood chips with calcium bisulfite solutions, were produced in large quantities. E. Mitscherlich's German patent of 1878 already claimed uses of this liquor for tanning hides, for producing binders and glues, and for fermentation with yeasts. While the last-named of the uses refers not to the lignin material but to the sugars accompanying it in the solution, the others are based on the lignin itself. Practical interest in all of them continues.

In Wisconsin, considerable quantities of sulfite cooking liquor have been spread on roads as a binder. Part of the sulfite lignin is sold as tanning agent, particularly in connection with chemical operations which yield vanillin. Fermentations are being carried out in relatively large scale for producing yeast from the sugars in the liquor. Thus, the old ideas have become industrial realities through the application of modern chemistry and engineering.

Lignosulfonic acids share with other sulfonic acids and with soap the property of reducing surface tensions. Thus they can be and are be-

ing used where formerly soaps had the field entirely to themselves.

Solid lignins, like those from wood hydrolysis, also have peculiar surface activities in collecting dissolved metals or organic compounds, for example phenols or proteins, on their surface. The practical use of lignins for purposes of purifying solutions or waste water would perhaps have developed if wood hydrolysis had become established as an industrial operation in this country.

The lignin acids produced in the alkaline cooking processes for the manufacture of cellulose are mostly used as fuels in recovering the alkali. Some quantities of these lignin derivatives are, however, consumed in the manufacture of plates for lead-acid electrical storage batteries. In another new development, this type of lignin is combined wiith synthetic rubber for improved toughness and heat resistance.

In general, there are two groups of uses for lignins: as raw material for the production of chemicals, like vanillin and tanning agents, and as a physically acting ingredient in binders, detergents, cements, fillers and plasticizers, dispersants and collectors for materials in solutions.

Only some of the actual uses of lignins have here been indicated. The variety of fields of applications is impressive. And yet, the possibilities are far from exhausted or fully explored. From the results of scientific work on lignins, a number of very specific chemical uses could be expected in the future. This statement may seem to be too optimistic. Those who are inclined to skepticism might point out that there are no markets for some of the fine chemicals that could be obtained by following the leads given by the disclosure of lignin structure.

Suppose it were possible to reconvert lignin into the coniferyl-aldehyde from which science says it is derived; what, the skeptics object, would we do with thousands of tons of it? Is not the known production of vanillin severely limited by its sales potential?

The answers to such questions can be found in recent developments of chemical industries. Many chemicals which a few decades ago were laboratory curiosities have become available and are now needed in carload quantities. More specifically, work on extending markets for vanillin by further chemical conversions is actively being pursued (I.A. Pearl, Appleton).

The potentials offered by the reactions of lignins with chlorine, or with hydrogen, are still relatively unexplored. Chlorinated phenol derivatives can be expected to have specific fungicidal and insecticidal actions. If cyclohexanol, one of the products of the lignin reaction with hydrogen, could be economically produced, it could easily be sold in large quantities.

The potential field for derivatives of lignin acids, like those obtained by reacting lignin with alkalies, is perhaps equally large. A combination of producing fine chemicals in relatively small yields, and bulk chemicals from the remaining lignin residues, may prove to be generally successful, as it now is in at least a few industrial operations.

Appendix: Recent Patents on Lignin Derivatives and Utilization

1. **As a Binder**

U.S. No. 2,549,822, April 24, 1951, W. E. Koonce. Assigned to Masonite Corp.

A binder is broadly claimed, "consisting essentially of the water soluble reaction product resulting from hydrolyzing lignocellulose material at an elevated temperature and pressure in the presence of moisture". Such a reaction product would be any of the lignins resulting from any delignifying pressure cooking in the presence of water. The binder is to be used for foundry compositions.

2. **Separation of Alkaline Lignin**

U.S. No. 2,464,828, March 22, 1949, Arthur Pollak, J. J. Keilen Jr. and L. F. Drum. Assigned to West Virginia Pulp & Paper Co.

Liquor from the alkali cooking of wood is concentrated, the soaps are separated and removed, the resulting purified liquor is treated with carbon dioxide and heated to coagulate and precipitate the lignin.

U.S. No. 2,541,059, Feb. 13, 1951, C. C. Heritage and others. Assigned to Weyerhaeuser Timber Co.

Ligno-cellulose material is extracted at atmospheric pressure with an alkali, using not more than about 15 parts of alkali per 100 parts of the ligno-cellulose material; the resulting alkaline solution is separated, neutralized, and precipitated by adding salt thereto.

3. **Alkali Treatments of Sulfite Liquor**

U.S. No. 2,405,450, Feb. 1, 1944, J. R. Salvesen et al. Assigned to Marathon Corp.

Lignin is converted into degradation products of low molecular weight by treating "a lignin substance" with a mixture of water, sodium hydroxide, and a water-immiscible aliphatic alcohol, e.g. butanol, at temperatures of 270° to 350° C.

U.S. No. 2,433,227, Dec. 23, 1947, Harry F. Lewis and Irwin A. Pearl. Assigned to Sulphite Products Corp.

Lignin is digested in an aqueous alkaline solution containing mercuric oxide, and after the reaction the product is acidified with sulfur dioxide.

U.S. No. 2,434,626, Jan. 13, 1948, J. R. Salvesen, D. L. Brink, and others. Assigned to Salvo Chemical Corp.

Vanillin is produced by heating lignosulfonic acid solutions with caustic alkali to about 160° to 170° C. while oxygen is continuously introduced until about 25 to 35 grams of oxygen are consumed by 100 grams of lignin originally present in the system.

U.S. No. 2,482,594, Sept. 20, 1949, I. A. Pearl and Louis Wise. Assigned to Institute of Paper Chemistry.

A lignin substance is reacted with sodium chlorite in a hot aqueous reaction mixture which is slightly acidic until the lignin is dissolved. The solution is then acidified and extracted with a water-immiscible solvent to recover phenolic materials.

U.S. No. 2,483,599, Oct. 4, 1949, Irwin A. Pearl. Assigned to Sulphite Products Corp.

A lignin substance is oxidized at a temperature of at least about 50° C. by silver oxide in the presence of the solution of sodium hydroxide, then acidified, and extracted with a solvent of vanillic acid.

U.S. No. 2,488,186, Nov. 15, 1949, D. H. Grangaard. Assigned to Sulphite Products Corp.

A lignin substance is reacted with a stable amine hydrochloride mixture at a temperature of about 200° C. for two to three hours. The resulting mixture is acidified and extracted with a solvent of phenol.

U.S. No. 2,505,304, April 25, 1950, Salvesen and others. Assigned to Marathon Corp.

A solution containing 250 to 350 grams of sodium lignin sulfonate and 50 to 100 grams of sodium hydroxide is heated for 30-130 minutes to a temperature of 265° to 325° C. and then neutralized to a pH of about 10.5.

U.S. No. 2,598,311, May 27, 1952, E. W. Schoeffel. Assigned to Salvo Chemical Corp.

An alkaline lignin solution is subjected to the action of oxygen at about 200° C. and a pressure of about 1000 psi for a time not exceeding 10 minutes. The reacted solution is rapidly cooled for the recovery of vanillin.

4. **Tanning Materials; Reactions with Proteins**

U.S. No. 2,437,044, March 2, 1918, E. A. Robinson and R. M. Beach. Assigned to Nopco Chemical Corp.

Lignin sulfonic acid or a formaldehyde-condensation product of it, is reacted with a solution of a water-soluble dichromate, of which not more than 20% based on the weight of the lignin compound is to be used.

U.S. No. 2,640,052, May 26, 1953, W. B. Stoddard Jr. and O. Hamilton. Assigned to Champion Paper & Fibre Co.

Alkali lignin is chlorinated by reacting with chlorine until the lignin product contains from 15 to 30 per cent of combined chlorine. The product is to be used as a tanning agent.

U.S. No. 2,676,170, April 20, 1954, G. H. Patterson and W. J. Baloa. Assigned to Du Pont de Nemours & Co.

Alkali lignin is reacted in alkaline solution with formaldehyde and a halogenated aliphatic acid at temperatures up to 105° C. to produce water soluble alkali-methal salts to be used as tanning agents alone or together with normal vegetable extract.

U.S. No. 2,351,413, June 13, 1944, Eduard Farber et al. Assigned to Overly Bio-Chem. Research Foundation.

A fermented liquor containing glycerine is purified by treating with a water-soluble form of a lignin.

U.S. No. 2,452,000, Oct. 19, 1948, J. L. Wallerstein et al. Assigned to Overly Bio-Chem. Research Foundation.

Enzymes are precipitated from their solutions by adding a water-soluble form of a lignin.

5. **Uses of Colloid Properties of Lignin**

U.S. No. 2,449,230, Sept. 14, 1948, C. E. Irion. Assigned to Margot Corp.

To a liquid printing ink is added as the main binder "a lignin from fiber liberation".

U.S. No. 2,471,384, May 24, 1949, R. B. Booth and R. A. Pickens. Assigned to American Cynamid Co.

A salt of a lignin sulfonate is used as a promoter in the froth flotation of metallic sulfide minerals. The quantity of the lignin salt is from 0.01 to 0.50 lbs. per ton of the minerals.

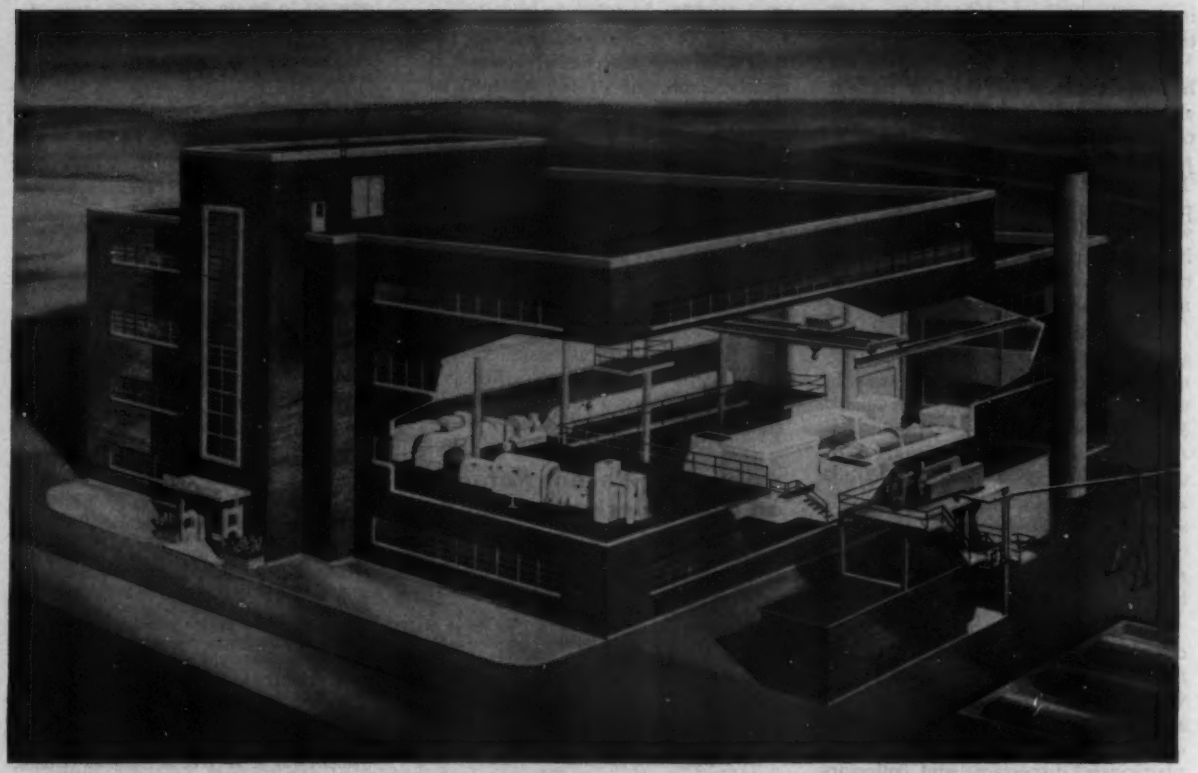
U.S. No. 2,476,845, July 19, 1949, R. D. Dawson. Assigned to Shell Development Co.

A well drilling emulsion of a mineral oil in water contains a small quantity, from about 0.5 to 5.0 per cent, of a lignosulfonic acid as the emulsifying agent.

U.S. No. 2,491,832, Dec. 20, 1949, Jorgen R. Salvesen and Carlyle Harmon. Assigned to Marathon Corp.

Sulfite waste liquor is treated with caustic alkali and air, insoluble calcium salts are filtered off, and filtrate is acidified to precipitate the partially de-sulfonated hydrolyzed lignosulfonate compounds for use as dispersing agents.

(Continued on page 1221)



Cutaway drawing of the new development laboratory of Westinghouse's steam division

Westinghouse's new laboratory presages the development of improved turbines

THE CONSTRUCTION OF Westinghouse Corp.'s new Steam Division development laboratory in Philadelphia was considered a "must" in view of the anticipated large demand for capital equipment and a greatly improved performance of this equipment. Among the specific considerations that led to the erection of this laboratory are the following:

1. It has been estimated that the rate of increase of electric power consumption in this country is 7.38 per cent per annum, or 103.8 per cent in 10 years. This means that presently installed generating and distributing capacity will have to be doubled in the next 10 years.

2. Until recently it was believed that practical operations of steam pressures were limited to a range below the critical pressure of 3,206 psi (when steam and water are of the same density). It is now believed that operation at pressures 1,000 psi above the critical pressure is

Chart showing growth of installed generating capacity

entirely practical and may offer substantially higher turbine efficiencies. Accordingly, the 275,000-kw turbine, which is now being designed for Philadelphia Electric, will operate at 5,000 psi.

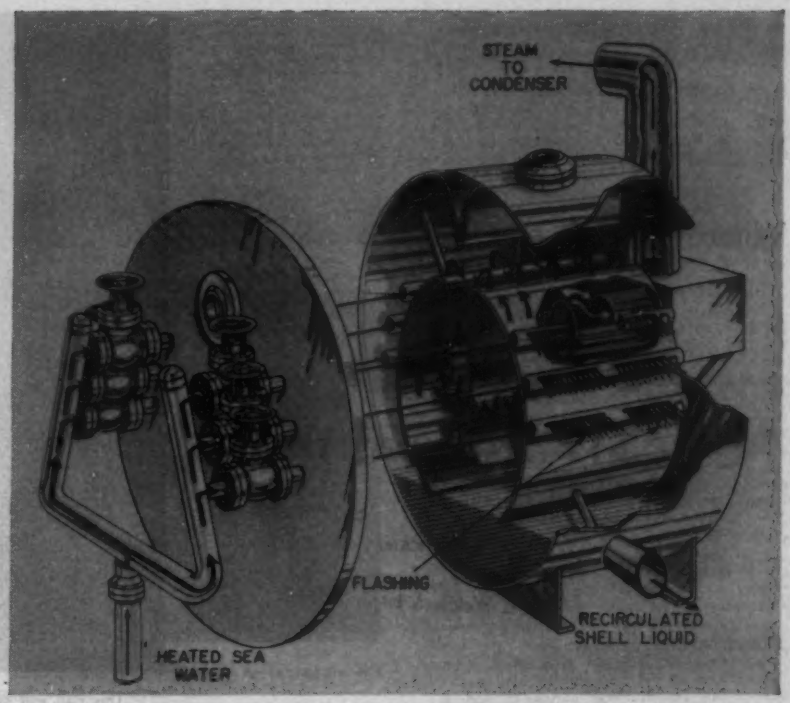
3. It is anticipated that in the next 5 to 10 years the gas turbine will become a major contending factor in the field of power generating for ratings between 1,000 and 15,000 kw. The advantages incorporated in the gas turbine are those of (1) light weight; (2) portability; (3) low cooling water requirements; (4) increased output at low ambient temperatures, and (5) quick starting.

Problems posed by the operation of gas turbines are those of (1) effective release of chemical energy by combustion of fuel in a highly confined space and (2) high temperature corrosion of the oil ash on turbine and blade materials.

4. New heat transfer problems, associated with the development of high-pressure turbines, will have to be evaluated. An exhaustive study will be undertaken of the use of compressed hydrogen in heat transfer applications. Hydrogen has excellent heat transfer properties and is now used in the tubes of heat exchangers in large generators. The long-range program calls for the development of effective heat exchangers for gas turbine power plants as well as special heat exchangers and steam generators for nuclear power plant applications.

5. More effective surface condensers will have to be developed to lower the back pressure on the turbine and thus extract more energy from the steam. In this connection the phenomenon of "dropwise" condensation will be investigated. In currently used surface condensers the steam condensate covers the surface condensers as a continuous film, thereby setting up a barrier to heat transfer. By the use of suitable "promoters" such as fatty acids, or water-repellent silicones, it is possible to induce "dropwise" condensation, thus leaving large areas of the surface free of condensate and greatly increasing the heat transfer to the tube. (This application has been successfully used in achieving better heat transfer in paper mill dryer rolls as reported in THE PAPER INDUSTRY, April, 1954).

6. Work is being done on the development of a flash evaporator that will efficiently convert sea water into commercially pure water. The flash evaporator which is now being tested in the laboratory uses low-temperature waste heat to heat sea water, which is then sprayed into a low-pressure chamber where a certain fraction of it flashes to steam. Moreover, most of the salt is separated out upon flashing, thus largely eliminating scaling of the evaporator's surface.



Cutaway sketch of flash evaporator now under test at the laboratory

7. The development and the rapid acceptance of mechanical, drive turbines, which now operate at 6,000 to 12,000 rpm and have ratings from 4,000 to 10,000 hp, pose such problems: (1) stresses resulting from the high rotor speed, (2) the wearing of parts which may come in contact with the rotor, and (3) vibration and critical speed phenomena. All these problems will be investigated in the new laboratory.

8. In the field of metallurgy continued research will be focused on the behavior of metals under stress and the development of creep- and rupture-resistant alloys that will be suitable for the operation of high-speed, high-temperature turbines.

The $6,000,000 new development laboratory is divided into several functional areas. On the first floor a large heavy machinery hall, three stories high, is provided with floor plates for mounting turbines. A 15,000-kw gas turbine power plant can be erected here. On the same floor a steam turbine test section, two stories high, is equipped with foundations and complete auxiliaries adequate to test turbines up to 12,500-kw ratings. A compressor test area will be equipped with a 5-ft. diameter closed-circuit wind tunnel. A hydraulic and heat transfer test area is provided in one bay where power plant auxiliaries can be developed. This area is equipped with fluid circuits and tanks containing submarine windows.

The mechanical laboratory is equipped with vibration generators, in a sound-proof room, and bed plates for strength, deflection, endurance, and bearing tests.

The second floor is laid out for blading and air flow development. Stationary cascade tests will be conducted here, and the full characteristics of various types and combinations of blades will be studied in wind tunnels.

The third floor is primarily equipped for gas turbine combustion development. Here arrangements of burners for optimum efficiency and life for all types of fuel will be investigated. Separate facilities are provided for evaluating the corrosive effects of combustion products.

When your salesman makes a call . . .

Do you get your $17.24* worth?

ART KANASKI

Vice President, Research
Waldie & Briggs Inc.

This call will cost you $17.24. What are your chances of making a sale?

ROBERT BOND, high-powered paper salesman for Super-Bond Paper Mills Inc., has just finished breakfast at his hotel. He flips through his pocket notebook as he waits for his coffee to cool. There are three sales prospects on whom he would like to call this morning before returning to the home office, but he has to leave town on the 10:30 plane. There will be time enough for just one call. Which one should it be?

What are the odds?

Now, Robert, don't conduct an elimination contest with a coin to make your decision. Play the odds instead. How? Well, what do you know about your three prospects, Company "A", Company "B" and Company "C", besides the fact that none has ever bought any paper from your firm?

Bob knows that each company publishes a monthly external house organ, and he estimates that each of these publications uses about 10,000 lbs. of enamel stock per month. He also knows that about six months ago the purchasing agent of Company "A" wrote for samples of a sheet that was featured in one of Super-Bond's ads. The samples were sent to him together with price lists, and he has been on

*Average cost of an industrial sales call, according to the New York Sales Executive Club.

▶ Effective sales control can increase your salesmen's value and cut the cost/sale

the company's sales control list ever since. Once or twice each month since then, the purchasing agent of Company "A" has received some promotional material from Bob's firm, either a kit of paper samples or an interesting, informative sales letter. Some months he has also received a copy of an exceptionally fine printing job that used one of Super-Bond's sheets with a small note clipped to it telling the details of the job. One of the recent mailings included a return post card on which the PA checked the box indicating that he would like a salesman to call on him.

The advertising manager of Company "B" had answered one of Super-Bond's ads just before Bob left the home office on his current trip. This advertising manager asked for the new Color Chart of Index Papers that was offered in the ad, and this chart was sent to him promptly.

All that Bob knows about Company "C" is that its external house organ is edited and produced by the company's public relations department.

You see, Robert, there is no need to draw straws after all, is there? According to figures compiled by the New York Sales Executives Club, you have 38.4 chances out of 100 selling the purchasing agent of Company "A" because he has been receiving your product literature, he is familiar with your company and has asked to have a representative call on him. Not bad odds for any salesman! At Company "B" your chances are 16 out of 100 of selling the advertising manager, who sent an inquiry as a result of your firm's advertising. That is less than half as good a chance as at Company "A". But your chances are even less of carrying off an order at Company "C" — only 9.2 chances out of 100, in fact!

Needed sales control

Robert Bond is a fortunate salesman. He sells for a company that realizes the value of pre-disposing a prospect toward their product before a salesman ever calls — through effective use of advertising and literature. But the sales control efforts of Super-Bond Mills do not stop there! The sales manager knows that it costs just as much to have a salesman call on a prospect who uses five tons of paper a year as it does to have him call on another prospect who uses

Quite a few years of experience have taught the top sales executive how to segregate the approximately 20 per cent that represents the cream of the prospect list

50 tons per year. Analysis of his sales records shows that approximately 20 per cent of his customers account for between 75 and 80 per cent of his sales volume, and experience indicates to this canny sales manager that the same figures can be applied to prospects: that is, about 20 per cent of his prospects represent approximately 80 per cent of his sales potential. (If you doubt these figures, check your own company's sales for the last year . . . or any year!)

Quite a few years of experience have taught the top sales executive how to segregate this approximately 20 per cent that represents the cream of the prospect list. Of course, the standards that he applies vary depending on what branch of industry the prospect is in. Printers are naturally one of the most important classifications, and our sales manager has learned that 15 per cent of the commercial printers represent 70 per cent of the potential volume in that field. On the other hand, only 10 per cent of the greeting card printers represent 70 per cent of the potential volume in that field.

There is still one more characteristic of the sales control program of Super-Bond Mills that helps Bob to sell, and that is the manner in which information about prospects is published to the salesman. Pertinent information about prospects isn't just pigeon-holed in the office prospect file; it's sent to all of the salesmen, branch offices, and sales representatives in a monthly bulletin. The main points of information covered by this bulletin are: (1) new prospects to be added to the prospect list of the appropriate territory men; (2) the sales manager's judgment as to whether or not the prospect is one of the 20-25 per cent of the prospects in its field that represent approximately 70-80 per cent of the potential market in its industry; (3) names and titles of the prospect's employees who actually influence the buying decision concerning paper; (4) requests for information, samples or literature received from prospects; and (5) what material has been sent in answer to these requests.

Do your salesmen have the advantages that Robert Bond had when he decided to call on Company "A"? Bob knew that Company "A" was large enough to be in the top 20-25 per cent of the prospects in its industry. He knew that the man who influenced paper purchases was the PA. He knew that this PA had been conditioned in favor of Super-Bond Mills through the company's advertising and direct mail — the quality and effectiveness of which had been proven to him many times in the past.

Think it over. If you aren't giving your salesmen these advantages in a market that continues to get more and more competitive, then you probably aren't getting your $17.24 worth out of your salesmen's calls!

Lignins and their uses

(continued from page 1217)

U.S. No. 2,525,433, Oct. 10, 1950, A. Voet. Assigned to J. M. Huber Corp.

Lignin dissolved in a watermiscible glycol is used together with pigments in an amount of from 1 to 5 parts by weight of lignin for each part of pigment.

U.S. No. 2,577,390, Dec. 4, 1951, W. H. Watson. Assigned to Polymer Corp.

In the polymerization of an emulsion containing butadiene and copolymerizable compounds, lignin is added to terminate the polymerization reaction.

6. Lignin for Water Purification

U.S. No. 2,415,439, Feb. 11, 1947, W. D. Nelson

A neutral aqueous suspension of cellulose-free lignin is added to the liquid to coagulate and remove with the impurities originally present in the liquid.

U.S. No. 2,449,209, Sept. 14, 1948, E. Farber and M. Sciascia. Assigned to Timber Engineering Co.

The absorptive capacity of lignin from wood saccharification is improved by pretreatment with mild alkalis and washing.

U.S. No. 2,503,104, April 4, 1950, E. Farber. Assigned to Timber Engineering Co.

A soluble lignin-containing solution of hydrolized sugar from wood is used for precipitating the soluble silver from its complex solutions.

U.S. No. 2,505,457, April 25, 1950, Paul G. Bird. Assigned to National Aluminate Corp.

The product obtained by an alkaline hydrolysis of sodium lignosulfonate with caustic alkali at temperatures between 265° to 325° C. is used as a scale-inhibiting addition to boiler feed water.

U.S. No. 2,576,386, Nov. 27, 1951, Paul G. Bird. Assigned to National Aluminate Corp.

A sodium lignosulfonate, hydrolyzed from alkaline treatment, is added to boiler feed water to inhibit scale formation.

U.S. No. 2,589,252, March 18, 1952, C. C. Heritage and W. G. Van Beckum. Assigned to Weyerhaeuser Timber Co.

Metal is recovered from its water solution by the addition of a water soluble lignic acid forming an insoluble metal lignate with the metal solution.

7. Lignin in Fertilizers and Soil Conditioners

U.S. No. 2,663,628, Dec. 22, 1953, Alfred M. Thomsen.

The lime is precipitated in a spent sulfite cooking liquor, ammonia and ammonia carbonate mixed with potassium hypophosphite are added to provide a lignin fertilizer base.

8. Converting Black Liquor Lignin

U.S. No. 2,680,113, June 1, 1954, Erich Adler and Erik K. Hägglund. Assigned to Svenska Cellulonsaforeningens Centrallaboratorium, Stockholm.

Black liquor lignin is sulfonated by treatment with sulfurous acid and then oxidized to make it watersoluble.

9. Hydrogenation

U.S. No. 2,390,063, Dec. 4, 1945, K. Freudenberg and W. Lautsch. Assigned to Alien Property Custodian.

Alkaline lignin in an aqueous alkaline medium is reacted with hydrogen under pressure of 30 to 120 atmospheres at temperatures of 250° to 420° C.

10. Resins and Molding Compounds from Lignin

U.S. No. 2,161,749, June 6, 1939, N. T. Samaras et al. Assigned to the Mead Corp.

A lignin material which in oven-dry condition has a melting point of about 220° to 230° C. is modified with furfural in an amount of 8 to 12%, thereby reducing the melting point of the lignin substantially.

U.S. No. 2,228,976, Jan. 14, 1941, H. J. Reboulet. Assigned to the Mead Corp.

Molding materials are produced by bringing an alkaline black liquor first to a pH of between 8 and 9 which causes about 25% of the total solids to precipitate, and then to a

(Continued on page 1224)

Design for increased productivity

New roll handling conveyor

AS A PART OF a modernization program, the Akron (Ohio) *Beacon Journal* is revamping its roll handling operations. Formerly, newsprint arrived at a public warehouse by rail, was unloaded, stored until needed, and then reloaded onto street trucks to be carried to the newspaper's plant, where it was again unloaded and taken to the presses.

Under the new system, designed by Wm. Ginsberg Associates, New York engineering consultants, newsprint will be taken directly from incoming cars to storage within the news plant itself, thus eliminating loading and unloading the trucks, the trucking operation, and use of public warehouses.

A new building has been erected adjacent to the company's existing building, and this addition extends the *Beacon Journal's* property to the point where it is just across the street from an Erie Railroad depot.

Permission was obtained from the Erie and from the city of Akron to erect a conveyor leading from the depot and under the street to the *Beacon* Journal's plant.

Paper now is unloaded at the depot by an industrial lift truck and deposited on the depot-end of the conveyor (Fig. 1). The conveyor, manufactured by Gifford-Wood Co., Hudson, N. Y., then descends to below street level (Fig. 2). Lugs rise at intervals as the conveyor declines to prevent rolls from sliding down the 23° slope. These lugs become flush as the conveyor resumes horizontal travel (Fig. 3).

The paper is conveyed into a below-street level of the plant (Fig. 4) and an automatic, air-actuated kick-off pushes the rolls off the conveyor (Fig. 5). They are then picked up by an industrial truck with a special clamping device and taken to storage.

The kick-off operates as a roll of paper contacts a limit switch which energizes a solonoid valve to activate a pneumatically-motivated piston connected by linkages to the pusher which shoves the rolls off the conveyor.

The Gifford-Wood conveyor is of the slat type, the slats having concaved surfaces that nestle the rolls during transit. Slats are of maple—2½ in. thick by 11½ in. long by 18 in. wide. They are bolted at each end to angle-clips welded to two parallel endless steel chains (12-in. pitch). The chains ride on 20-lb. rails mounted on structural steel supports.

A fluid coupling between drive motor and gear reducer insures smooth conveyor operation, provides adjustable speeds of from 25 to 50 fpm, and enables reverse travel for return of empty cores to the loading platform. The conveyor is stopped and held under load by means of a magnetic brake.

Light-weight magnesium plates are provided to cover the pit in which the drive unit is installed and also to cover the depot pit when not in use. Safety railings are provided throughout the tunnel and are to be installed around the depot loading area.

Fig. 1—Newsprint roll as received at depot and placed on Gifford-Wood conveyor for under-street delivery

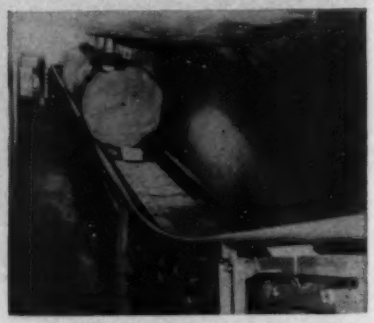


Fig. 2—Conveyor as it descends to below-street level. Lugs on inclined section prevent rolls from sliding

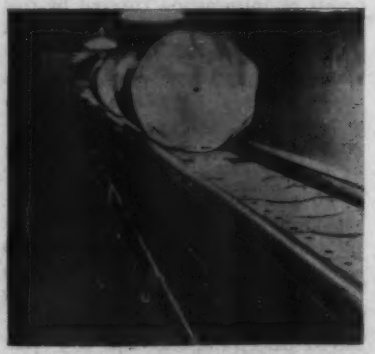


Fig. 3—Rolls as they travel underground on the Akron Beacon Journal's new Gifford-Wood conveyor

Fig. 4—Rolls leave conveyor tunnel and enter the newspaper's plant at below-the-ground level

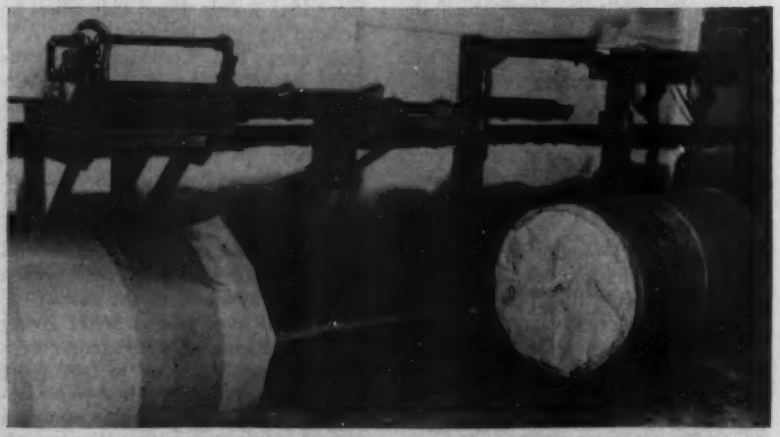


Fig. 5—Pusher automatically discharges roll from conveyor as roll trips limit switch

Importance of mill models in expansion planning

Model of the Bay West plant that was made by Bay Industrial Models.

USE OF THE FOLLOWING procedure enabled Bay West Paper Co. of Green Bay, Wis., to cut handling costs by about 50 per cent. The company also reduced raw material breakage by 50 per cent, finished product breakage was down to practically zero, and new storage and handling techniques permitted the storage of 30 per cent more jumbo rolls in the same area.

Since Bay West moved into its new plant three years ago, production has increased 25 to 30 per cent, giving rise to consideration of still further expansion. As a result of intelligent original planning, this expansion should be relatively simple because of the construction of one wall of insulated metal sheathing for easy removal.

Deciding upon the production rate is one of the first steps in planning. When the production rate is known, a decision must be made as to how many days' raw material supply is needed. This in turn will determine the approximate area needed for raw material, the finished product and converting machinery. The mill model relates all raw materials, finished products, machinery, equipment, conveyors, etc. to scale. Accurate over-all dimensions are furnished, as is just enough detail on the machinery to make it easily identifiable.

If the model is used intelligently, it can pay for itself over and over again. Since the model is three-dimensional, there is no difficulty in visualizing the plant layout. There is no need to refer from blueprint to blueprint in order to gain a clearer understanding of various arrangements, clearances of machinery, etc. As the production line is set up, executives, engineers, architects, and even department foremen can attend conferences, visualize the plant layout at a glance, and contribute through the resources of combined experience in deciding on the advantages and disadvantages of each proposed plan. Each plan should be photographed and suggestions attached for future reference.

Materials handling at Bay West

In the case of Bay West, it was decided that it would be more advantageous to use a truck equipped with a carton clamp than it would be to use fork trucks and pallets. This resulted in easier handling, eliminated breakage, and permitted the storage of more cases.

The most important section of the mill is converting machine area, since it influences the location of all other departments. The front portion of the Bay West plant contains offices, machine shop, print shop, etc., while the remaining area is divided into three more or less equal parts. The first portion houses a supply of jumbo rolls that are stored on-end to ceiling height. The section at the center of the building contains machinery in a straight-line flow arrangement across the width of the plant; thus, jumbo rolls are easily accessible to all machines; additionally, the arrangement is ideal for future expansion. The third section serves as storage for both the finished product and raw material.

Truck and rail docks are adjacent to both warehousing areas, permitting a short and unobstructed flow of materials at all times. (It is generally admitted by both truckers and railroaders that the Bay West shipping and receiving areas are ideally planned.)

Principal advantages

In a summation of the merits of mill models in any expansion program, the following advantages are easily apparent:

1. Complete visualization by all concerned.
2. Errors are eliminated and the operating efficiency increased by group planning and the resultant ideas from the easy shifting of scaled equipment.
3. New storage and handling techniques save space, time and breakage.
4. Through concise planning, start-up time is held to a minimum.
5. Thorough planning eliminates costly surveys and additional engineering fees.
6. A photograph of the layout can be used in place of drawings for the purposes of insurance, fire prevention and safety.
7. In complex plants the model becomes valuable as a training aid. Over-all plant operation is explained more easily on the model than in the plant itself.
8. A model can be displayed at conventions, at shows and at the plant itself long after actual operation has started.

G. J. Ticoulat of Crown Zellerbach Corp., who in an address before the Salesmen's Association of the Paper Industry discussed the business future in Europe

Two 1955-56 officers of Sapi meet prior to the annual luncheon. They are Thomas L. Stirling of Champion-International Co. and W. S. Wagley of Wausau Paper Mills Co.

Sapi Meeting

(Continued from page 1209)

Europe's growing needs," Mr. Ticoulat continued. "Russia may become a factor, but that is in the future. This is an optimistic picture, and only war can change it."

The speaker is chairman of the board of National Sales Executives.

Graham New President

Elected 1955-56 president of Sapi was Lawrence E. Graham of International Paper Co., New York, N. Y. He succeeds H. M. (Stub) Early, also of International.

Turning to foreign markets, Mr. Ticoulat urged freer world trade "both ways" to meet problems created by Europe's industrial and economic expansion.

The Crown Zellerbach executive discussed business conditions in the U. S. and called them good. "The most heralded recession in history, that of 1953, has turned out to be the biggest false alarm in history," he said. "We are now back in a buyer's market."

Insatiable Demand

E. W. Tinker, APPA executive secretary, told the Sapi delegates that, "Both the Canadian and U. S. industries are faced with new responsibilities, for changed communication and transportation facilities have and are setting new standards in the fields of industrial development, education and sanitation on a world-wide basis. For these developments paper and paperboard are necessities."

The speaker called the world demand for American pulp and paper products "almost insatiable." Hysterical consideration is being given to substitutes for wood pulp. "However," Mr. Tinker concluded, "the logical answer to this situation is the full development of the Canadian and U. S. industries. Limitations on our expansion will be the availability of a perpetual supply of pulpwood which, fortunately, is a renewable resource. On the basis of the forestry programs that are being initiated by the industry, in both Canada and the United States, I think that I am safe in saying that our output can, over the next decade, be doubled in order that we may meet our responsibilities."

King Wins Major Award

It was announced during the Sapi luncheon that the 21st recipient of the President's Award was John F. King of the Hollingsworth & Whitney Div. of Scott Paper Co.

The award is given annually at the discretion of the president to that member (not an officer) who is considered to have done most for the organization during the past year. According to Mr. Early, the retiring president, Mr. King was chosen for the honor because of his work with the membership committee.

In addition to Mr. Graham, 1955-56 officers of Sapi elected at the annual meeting are: eastern vice president, Charles H. Leissler of Mohawk Paper Mills Inc.; assistant eastern vice president, Henry L. Cole of S. D. Warren Co.; western vice president, Paul C. Craig of Champion Paper & Fibre Co.; assistant western vice president, William S. Wagley of Wausau Paper Mills Co.; New England vice president, Eugene O. Hansen of Brown Co., and assistant New England vice president, Thomas L. Stirling of Champion-International Co.

Lignins and their uses

(continued from page 1221)

high acidity to precipitate the rest of the material from the liquid.

U.S. No. 2,379,890, July 10, 1945, R. M. Dorland and R. M. Boehm. Assigned to Masonite Corp.

Lignin is esterified by reacting with alkali and then treating it with an esterifying compound.

U.S. 2,419,783, April 29, 1947, K. Longley. Assigned to Quaker Chem. Prodo. Corp.

An ester made from lignin sulfonate and a higher fatty acid derivative is claimed.

U.S. No. 2,429,102, Oct. 14, 1947, Harry F. Lewis and F. E. Brauns. Assigned to the Mead Corp.

The ester produced from black liquor lignin and an organic aliphatic acid of at least 12 carbon atoms is used as a mold lubricant.

U.S. No. 2,443,576, June 15, 1948, E. Farber. Assigned to Timber Engineering Co.

The lignin residue from wood hydrolysis is completely converted into a resinous material by reaction with the high organic acids present in tall oil and rosin.

U.S. No. 2,494,545, Jan. 17, 1950, R. N. Evans and A. P. Ingassia. Assigned to Masonite Corp.

Alkali-soluble lignin and a partially polymerized furfuryl alcohol are heated together in solution to produce a reaction.

U.S. No. 2,501,665, March 28, 1950, R. N. Evans and A. P. Ingrassia. Assigned to Masonite Corp.

An acid-hydrolyzed ligno-cellulose fiber is mixed with melamine and paraformaldehyde and molded under heat and pressure.

U.S. No. 2,664,408, Dec. 29, 1953, R. E. Plump and James W. Carroll. Assigned to Pennsylvania Salt Mfg. Co.

Acidified sulfite waste liquor is condensed with a water-soluble aldehyde, urea, and thiourea to produce a resinous material.

11. Mixtures with Cement

U.S. No. 2,141,571, Dec. 27, 1938, H. L. Kennedy and J. G. Mark. Assigned to Dewey & Almy Chemical Co.

Hydraulic cement is ground with the addition of a water dispersion of a lignin compound from lignin sulfonic acid.

12. Lignin for Reinforcing Rubber

U.S. No. 2,676,931, April 27, 1954, A. Pollack. Assigned to West Va. P. & P. Co.

Rubber latex and a "substantial proportion of lignin" in alkaline solution are co-precipitated.

13. Lignin in Electrical Storage Battery Plates

U.S. No. 2,683,185, July 6, 1954, G. S. Hole. Assigned to General Motors Corp.

When a lignin compound is used as expander in the paste for the negative plates, the resistance to summer temperature conditions is increased by adding a small amount, about 0.06% of the paste weight, of a poly hydroxy benzine.

See U.S. Patent No. 2,325,542 and 2,436,299 for addition of 0.2 to 2.0% of lignin products to the paste of the negative plates to increase the discharge rate of the battery at low temperatures.

14. Chemical and Biological Production of Lignin

U.S. No. 2,574,027, Nov. 6, 1951, Eduard Farber. Assigned to Timber Engineering Co.

A substantial portion of the cellulose of wood is converted into lignin-like substances by mixing the wood with a small amount of a mineral acid and heating the mixture to about 200° C.

U.S. No. 2,671,751, March 9, 1954, E. C. Kunz. Assigned to Givaudan Corp.

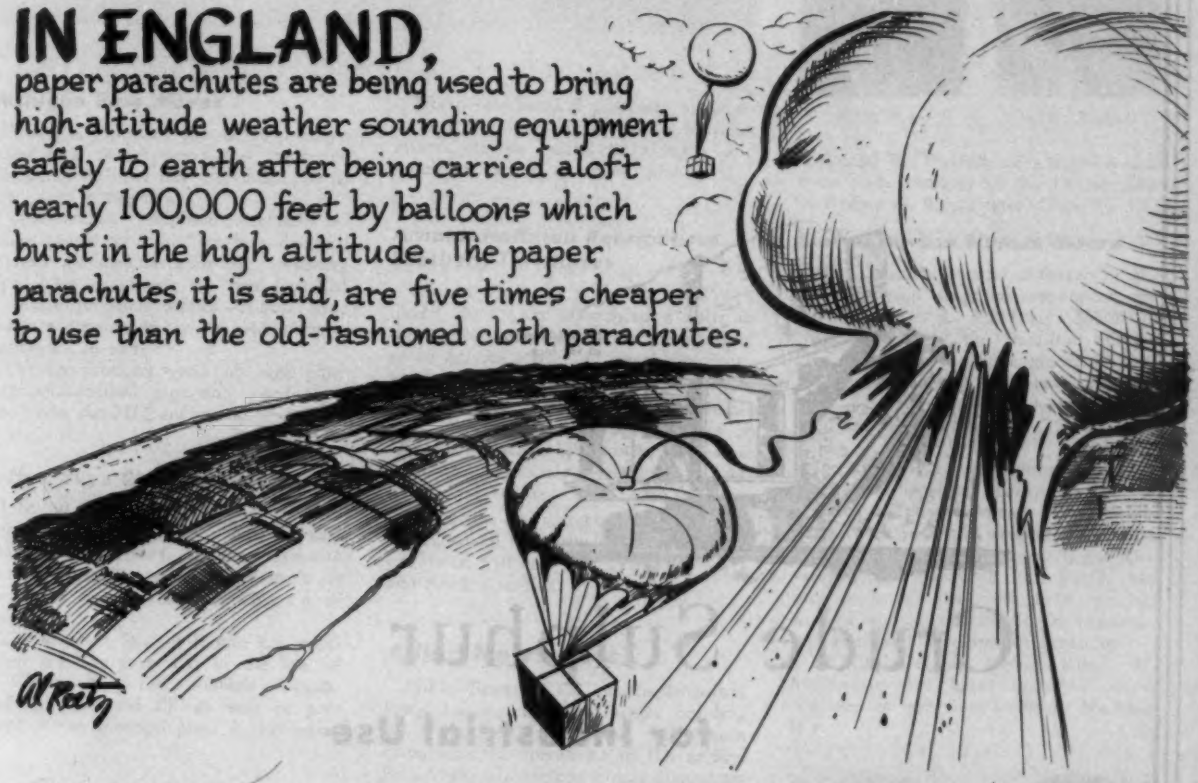
Wood is subjected to cellulose-destroying organisms, nutrients are added, temperature is kept between 27° and 32° C.

U.S. No. 2,694,013, Nov. 9, 1954, Worth C. Goss. Assigned to Sheetwood Products Co.

Claim 1: A glue comprising a mixture of brown rotted wood, ammonia, and an amide selected from the group consisting of urea, dicyanamide, melamine, and biuret.

PAPER SKETCHES

IN ENGLAND, paper parachutes are being used to bring high-altitude weather sounding equipment safely to earth after being carried aloft nearly 100,000 feet by balloons which burst in the high altitude. The paper parachutes, it is said, are five times cheaper to use than the old-fashioned cloth parachutes.



To cut down on noise, save on collection time and reduce maintenance costs, large, high-strength **PAPER BAGS** recently were tested as garbage can liners in Hartford, Connecticut. These paper liners were designed to hold soaking garbage without disintegrating and to eliminate the time-consuming, noisy job of carrying the cans themselves to the truck for emptying.

Surprisingly modern in appearance were the hat boxes of the early 1800's, made of paperboard and covered with fancy wallpaper. These hat boxes were popular for use during journeys by stagecoach.

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ALLIED NEWS

Michigan Pipe Moves

Michigan Pipe Co., one of the country's oldest pipe manufacturers, has transferred all operations from Bay City, Mich., to its new plant in Gagetown.

The recently completed structure occupies 16,000 sq. ft. and has been designed expressly for manufacturing and fabricating pipe. New equipment has been installed to insure precision control—critical large diameter dimensions can be held to thousandths of an inch.

The firm produces wood-lined steel pipe, thermoplastic-lined pipe and wood stave pipe under the MPC trademark.

Bolton Buys Claflin Refiner

John W. Bolton & Sons Inc. of Lawrence, Mass., has purchased the name and manufacturing rights of the Hermann Claflin refiner. The unit has been made for the last 25 years by Hermann Mfg. Co. of Lancaster, Ohio.

The Emerson Div. of Bolton has represented the Lancaster firm in the sale of the Claflin refiner for a number of years. Claflins, parts and fillings will be produced at the Emerson plant in Lawrence.

Morehouse Buys Cowles Dissolver Business

G. H. Morehouse and L. P. Smoot of Morehouse Industries, Los Angeles, have announced the purchase of the Cowles dissolver business of the Cowles Co., Cayuga, N. Y. The deal includes the plant facilities, land, buildings, machinery, inventory and equipment.

The Cowles dissolver is designed to dissolve particles of material in solution at exceptionally high speeds. Manager of the new operation will be Horton N. Meyer Jr., who was at one time associated with Cowles.

Northern Chemical to Build in Maine

Northern Chemical Industries Inc. of Baltimore has completed plans for the immediate construction of a $9,000,000 anhydrous ammonia plant at Searsport, Maine. In addition to anhydrous ammonia, the plant will produce nitrogen solutions, oxygen and nitric acid.

The source of anhydrous has been in the Midwest and South. With the completion of the new 125-ton per day plant at Searsport (scheduled for early next year), not only New England but also eastern Canada will have a local supply source.

Northern Chemical presently manufactures at Searsport chemicals for fertilizer mixers, textile mills, pulp mills and municipal water treatment plants.

Arnold, Hoffman Reorganizes Southern Territories

Arnold, Hoffman & Co. Inc. of Providence, R. I., has announced a split in the southern territory with the opening of an Atlanta office and warehouse January 1.

The new Atlanta office will handle all sales and warehousing for the states of Georgia, Florida, Tennessee, Alabama, Louisiana, Mississippi, Oklahoma, Arkansas and Texas.

The office and warehouse in Charlotte, N. C., which formerly handled all southern states, will now serve Virginia, North and South Carolina.

Allied News Notes

Fisher Governor Co. of Marshalltown, Iowa, has purchased a factory building in Woodstock, Ont., and will begin manufacturing operations in the spring. Production will include Fisher diaphragm motor valves, liquid level controllers and gas regulators. General manager will be William J. Bestmann, who has been in charge of production scheduling at Marshalltown.

Negotiations are being conducted by officials of Hooker Electrochemical Co. of Niagara Falls, N. Y., and Durez Plastics & Chemicals Inc. of North Tonawanda for the merger of Durez into Hooker through an exchange of stock. Durez is the nation's largest producer of phenolic resin and plastic moulding compounds.

The Pandia Inc. Div. of the Black-Clawson Co. has moved its offices to 250 Park Ave., New York 17, N. Y. The move was needed to provide additional working space and to allow closer liaison with B-C's New York office and that of Parsons & Whittemore.

Allied Personalities . . .

Henry J. Perry, at one time editor of *Paper Trade Journal*, has joined Lockport Felt Co., Newfane, N. Y., as head of the sales department. He succeeds the late W. W. Campbell Jr. A lecturer and writer on pulp and paper manufacture, Mr. Perry comes to Lockport from the position of secretary-director of the Waste Paper Utilization Council.

H. J. Perry

R. W. Bartlett

Roland W. Bartlett, sales engineer, has been made manager of the Detroit District office of Worthington Corp.

Black-Clawson Names Moore

R. L. Kutter, general manager of the Black-Clawson Co., has announced the appointment of L. A. (Larry) Moore as chief engineer at the Hamilton (Ohio) Div. Formerly on the engineering staff at American Coating Mills (now a Robert Gair Co. Inc. subsidiary) at Elkhart, Ind., he has been with B-C since early 1953.

In other B-C staff appointments, Joe Baxter Jr. has been named director of research and development. The appointment came with the announcement that B-C had established a Research and Development Department. Mr. Baxter has been with the firm since 1928 and has worked almost exclusively in engineering, sales and development functions.

At Middletown, Ohio, James H. Martindale has been appointed chief engineer of the Shartle Bros. Machine Div.

L. A. Moore (above l)

Joe Baxter Jr. (above r)

J. H. Martindale (right)

Donald A. Borden of Kalamazoo, Mich., former plant engineer for Ostego Falls Paper Mills Inc., is representing the Bauer Bros. Co. in Michigan, northern Ohio and northern Indiana.

Lewis W. Bentley has been named manager of the Detroit office of Industrial Crane & Hoist Corp. of Chicago.

E. L. Hiter has been made sales man-

. . . Fast, accurately measured saturation or coatings with the HUDSON-SHARP

PROCESSES SHEETS 50 to 95" WIDE WET OR DRY—

AW-2 WET OR DRY WAXER

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In addition to paper and film processing machines H-S produces the versatile, high speed CAMPBELL Wrapper. Get complete details today.

Smaller waxers and wax laminators for every converting need, available.

- Hollow cast iron, cross tied, non-vibrating frame.
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Controlled wax heating — steam, oil, or electricity.

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H-S friction clutch—flat or V-belt drive.

Single lever adjustable squeeze rolls.

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Write for complete details.

Completely versatile, this modern machine processes fully saturated or dry coated wax papers with equal ease of operation. In wet wax production, sheet is taken from parent roll and immersed in wax bath with movable adjustments to time the dwell of immersion period. Sheet then passes through a squeeze roll section to remove excess wax and through a chilled roll section direct to rewinder. For dry waxing, sheet is carried direct to an applicator roll where a measured quantity of wax is applied to one side of sheet, thence to a heated pressure roll which forces the wax into sheet. Unit features rewinding into a firm, accurate roll. Machine is built in two sections for spacing application unit and chilling-rewind section as desired. Open type construction permits free adjustment means and rapid material roll changes.

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¼ to 1% on dry fiber weight added to furnish at very **beginning** of refining cycle is **effective.**

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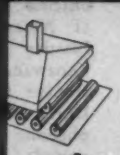

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Allied News . . .

ager of the Expansion Joint Div. of Flexonics Corp., Maywood, Ill. He was formerly western manager.

James D. Brown, a former representative of Sutherland Refiner Corp., has been named to the sales force of the paper and pulp department of Jackson & Church Co., Saginaw, Mich.

J. D. Brown

V. S. Risley Jr.

Wisconsin Wire Works has announced that the Dan Charles Agency has employed Victor S. Risley Jr. to "give closer attention to the sales and operations of Wisconsin wires." His territory will include Oregon, Washington, California and Idaho. Mr. Risley has been serving the West Coast paper industry since 1950.

Huyck Increases Field Service

F. C. Huyck & Sons of Rensselaer, N. Y., has increased its field service to the pulp and paper industry by the assignment of John Wilbur, Eugene L. Vogt and William C. McClure as field service engineers.

Mr. Wilbur, who is a member of Tappi and formerly associated with S. D. Warren Co., has been assigned mills in Indiana, Ohio and Tennessee. Mr. Vogt, formerly associated with Sutherland Paper Co. and Kalamazoo Vegetable Parchment Co., will serve mills in Indiana, Michigan, Ohio and Pennsylvania. Mr. McClure will cover plants in New York State and parts of New England. All three recently completed the F. C. Huyck training program in felt manufacture, design and application.

American Cyanamid Changes

A new alignment has been announced for the Paper Chemicals Dept. of American Cyanamid Co.

W. R. Donaldson, former assistant to the general manager, has been named assistant manager of the department.

A. R. Skelton has been named district manager at Mobile, Ala., and R. S. Meade has been given a similar post at Charlotte, N. C. Both were formerly technical salesmen to the paper industry.

John Verdon, formerly a technical salesman, has been named district manager at Kalamazoo, Mich.

Coming Events

Tappi

March 18-19—Southeastern Section, George Washington Hotel, Jacksonville, Fla.
March 24—Delaware Valley Section, Engineers' Club, Philadelphia
April 1—New England Section, Hotel Bond, Hartford, Conn.
April 12—Lake States Section, Conway Hotel, Appleton, Wis.
April 14—Ohio Section, American Legion Hall, Middletown, Ohio
April 28—Delaware Valley Section, Engineers' Club, Philadelphia

American Pulp & Paper Mill Superintendents Association

March 22—Miami Valley Division, Manchester Hotel, Middletown, Ohio
April 19—Miami Valley Division, Middletown, Ohio
April 23—Michigan Division, Hotel Harris, Kalamazoo

Other meetings

May 2-5—Electrochemical Society Inc., Sheraton-Gibson Hotel, Cincinnati
May 18-21—Third Western International Meeting of the Pulp & Paper Industry, Empress Hotel, Victoria, B. C.

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- OK BRAND E-Type Pearl
- OK BRAND Pearl 700
- OK BRAND Pre-Jel
- OK BRAND Thin Boiling Starch
- OK BRAND Oxidized Starches

NAMES in the NEWS

Schmon Elected Chairman of CPPA Executive Board

A. A. Schmon

Arthur A. Schmon was elected chairman of the executive board of the Canadian Pulp & Paper Association at the group's recent annual meeting at Montreal. Mr. Schmon is president of both Ontario Paper Co. Ltd. and Quebec North Shore Paper Co. Ltd.

He succeeds Paul E. Cooper of Crown Zellerbach Canada Ltd., former CPPA president who served as chairman in 1954.

Appointed vice chairmen of the board were P. M. Fox, president of St. Lawrence Corp. Ltd., and E. M. Little, president of Anglo-Canadian Pulp & Paper Mills Ltd. Mr. Fox and Mr. Little served as board chairmen in 1953 and 1954 respectively.

Mr. Schmon has been associated with the Canadian paper industry for more than 35 years. He joined Ontario Paper in 1919 as manager of the Shelter Bay, Que. mill. In 1923 he was named woodlands manager for the province of Quebec and in 1927 became vice president. He was elected president in 1933. In 1938 he was appointed president of Quebec North Shore, a subsidiary.

M. J. Foley Western Chairman

M. J. Foley

M. J. Foley, executive vice president of Powell River Co. Ltd., was elected chairman of the CPPA's Western Div. at the recent annual meeting in Vancouver, B. C. Clifford Crispin, vice president of the pulp division of MacMillan & Bloedel Ltd., was elected vice chairman.

At the Montreal meeting of the CPPA later in January, Mr. Foley was appointed honorary vice chairman of the executive board.

Collins Gets Hudson Post

T. T. (Tex) Collins has been named technical director for Hudson Pulp & Paper Corp. at Palatka, Fla.

Formerly with Thilmany Pulp & Paper Co. as chemical engineer and for the last two years technical director of National Container Corp., Mr. Collins has been associated with many branches of pulp and paper mill research and converting development. Some of his best known projects for the kraft industry include a black liquor oxidation process and the Venturi-Scrubber.

T. T. Collins

N. J. Niks

Niks Retires at Munising

N. J. Niks, manager and general superintendent for Munising Paper Co. in Munising, Mich., has retired after more than 23 years with the firm.

Mr. Niks began his career at the age of 13 as a screen boy with Dells Pulp & Paper Co. in Eau Claire, Wis. Later associations were with Northwest Paper Co., Cloquet, Minn.; International Paper Co., Niagara Falls, N. Y.; Rhinelander Paper Co., Rhinelander, Wis.; Sorg Paper Co., Middletown, Ohio; Robertson Paper Co., Ashuelot, N. H.; Hammermill Paper Co., Erie, Pa.; Diana Paper Co., Harrisville, N. Y.; Crocker Mill, Holyoke, Mass.; Orono Pulp & Paper Co., Orono, Maine; Detroit Sulphite Pulp & Paper Co., Detroit; Hawthorne Paper Co., Kalamazoo, Mich.; Kalamazoo Vegetable Parchment Co., Kalamazoo; Chillicothe Paper Co., Chillicothe, Ohio, and Munising Paper Co.

After six months with KVP Mr. Niks was made general superintendent, a position he held for several years, after which he took a similar post at Chillicothe. He was at Chillicothe 10 years prior to joining the Munising staff in 1931.

Mr. Niks is the holder of a number of patents, including several on inlets, a felt edge dryer, and an open breast roll with adjustable apron.

Van Douser Retires

A. M. Van Douser retired in January as secretary of Marathon Corp. He was associated with the paper industry 50 years, 45 of them with Marathon.

Mr. Van Douser entered the industry in 1905 as a clerk for Munising Paper Co. He was chief clerk when he left in 1909 to become an auditor for Marathon at Rothschild, Wis. At the time of his retirement he was one of the firm's oldest employees in point of service.

Mr. Van Douser was named assistant secretary and treasurer for Marathon in 1927 and in 1942 was elected secretary and treasurer. He has been a member of the board of directors since 1951.

New Gilbert VPs

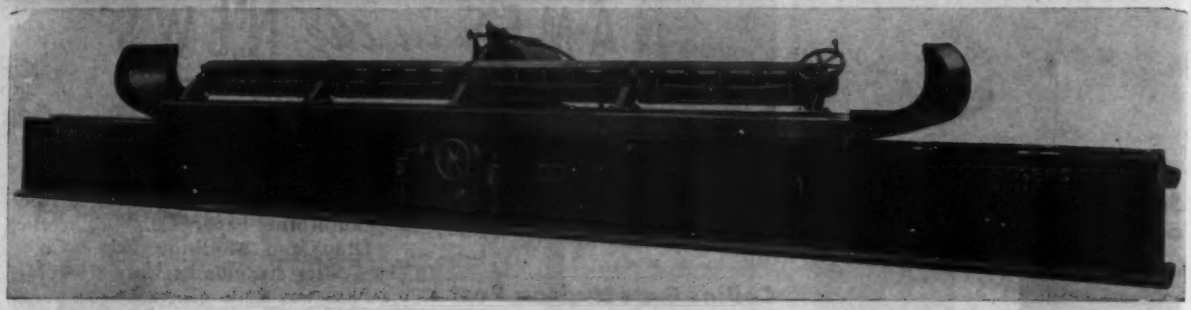
Three new vice presidents and a new secretary have been elected by Gilbert Paper Co. at Menasha, Wis. T. M. Gilbert was reelected president.

Newly elected vice presidents are N. T. Gilbert, vice president and sales manager; William Gilbert, vice president and director of purchases, and Thomas Catlin, vice president and mill manager. John D. Schmerein Jr. was named secretary.

Nicholson Named President of Michigan Paper

Effective July 1, Llewellyn D. Nicholson will become president of Michigan Paper Co. in Plainwell,

ROGERS SERIES 220 MASSIVE KNIFE GRINDER



SERIES 220 . . . is a powerful, new design for high production and fast grinding of all heavy duty straight chipper and paper knives. Model illustrated above handles knives up to 220" long. Its sturdy cabinet base is 30' long and its entire weight is more than 10 tons.

Variable reversing motor drive allows for slow and fast table traverse. Self-aligning 5" wide V-ways on cabinet base and carriage absorb grinding pressures, permit heavy cuts without vibration. Magnetic chucks are available to further speed the grinding cycle and reduce setting time.

Other features assure long life and accuracy. Ask about the Series 220 . . . many sizes. Write today!

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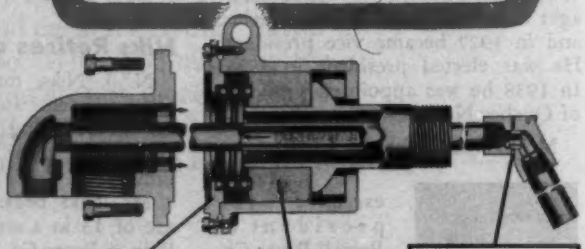
SELF-SUPPORTED TYPE with SYPHON ELBOW



ASSEMBLY PLATE — Holds internal parts in position when head is removed.

SELF-SUPPORTING — Needs no external supports of any kind.

SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

WRITE FOR INFORMATION

Bulletin S-2061 has all the facts on this joint-and-elbow combination that supports itself, has no packing, needs no lubrication, outmodes unwieldy syphon pipes. Johnson Joints are also available in pipe-supported and rod-supported types, to suit all operating needs.

The Johnson Corporation

845 Wood St., Three Rivers, Mich.

Mich., a wholly owned subsidiary of W. C. Hamilton & Sons of Miquon, Pa. He was to have joined the staff in March.

Mr. Nicholson succeeds Allan B. Milham, who is retiring on June 30 after serving as president since 1952. Prior to joining the Plainwell firm, Mr. Nicholson was manager of the Lestershire Div. of National Vulcanized Fibre Co. in Binghamton, N. Y.

Robert S. Welch, since 1946 supervising engineer at the St. Regis Paper Co. kraft division in Carthage, N. Y., has been made resident engineer of the paper and panelite mills in Kalamazoo, Mich.

Necrology . . .

Henry K. Benson

Henry Kreitzer Benson, well known author and researcher in pulp and paper technology, died recently in Seattle at the age of 78. Dr. Benson was emeritus professor of chemical engineering and retired chairman of the department of chemistry and chemical engineering at the University of Washington.

With W. E. Breitenbach and D. B. Davies, Dr. Benson was instrumental in bringing about the organization of the Pacific Section of Tappi. The section held its first meeting at the University of Washington in 1928.

Problems relating to the pulp and paper industry were of special concern to Dr. Benson, and in recent years several of his papers have dealt with pulping by ammonium bisulfite solutions and with various aspects of sulfite spent liquor.

R. P. Kernan

Robert Peebles Kernan, former president of Donnacona Paper Co. Ltd. in Donnacona, Que., died January 1 at the home of a daughter in Montreal. He was 73.

A native of Utica, N. Y., Mr. Kernan was a pioneer in the Canadian paper industry, having moved his residence there in 1910. After relinquishing the presidency of the firm, he had served as chairman of the board and as a director.

Lawrence G. Wilson, 64, treasurer of Rayonier Inc. since 1944, died December 16. He joined the firm in 1936 as comptroller.

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Available in sizes from 4" to 30" in diameter and thicknesses from 14 to 7 gauge. Standard lengths of 20 and 40 feet or furnished cut to exact length as specified. Write for Bulletin No. 507.

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for light-weight pipe. Carried in stock in carbon steel with 10-gauge wall thickness. Also available in ⅛", ¼" and ⅜" thicknesses in steel, alloys, and stainless steels. Write for Bulletin No. 525.

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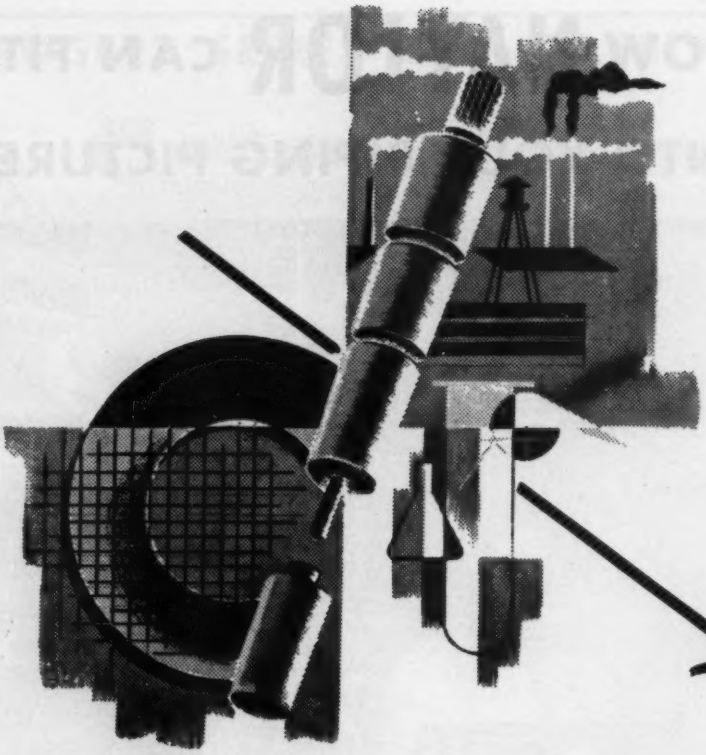

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SAFETY NEWS

1954 NSC Pulp and Paper Contest Shows 12 Per Cent Rate Reduction

COMPETING MILLS in the 1954 National Safety Council contest for pulp and paper firms have reported an accident frequency rate 12 per cent below that of 1953. Sixty contestants maintained perfect scores, as compared to 41 in 1953.

The year's frequency rate for all divisions was 7.43; for the pulp and paper division, 7.14, and for the paper converting division, 8.21. Contestants numbered 497, up from the 443 of 1953.

From eligible mills in Division I the board of judges will choose the mill with the most outstanding record. That mill will be awarded the grand prize, the Edward Benton Fritz Memorial Trophy, presented each year by THE PAPER INDUSTRY at the National Safety Congress.

The NSC has listed the mills with the best records in each division and group as follows—frequency rates in parentheses:

Division I—Pulp and Paper Mills

Group A

1—The Flintkote Co., Los Angeles (0.72)
2—Ecusta Paper Corp., Pisgah Forest, N. C. (1.21)
3—Sonoco Products Co., Hartsville, S. C. (1.28)

Group B

1—Crossett Paper Mill, Crossett, Ark. (0.00)
2—Consolidated Paper Corp. Ltd., Shawinigan Falls, Que. (0.53)
3—Price Bros. & Co. Ltd., Riverbend, Que. (0.99)

Group C

1—Manitoba Paper Co. Ltd., Pine Falls, Man. (0.00)
1—Crystal Tissue Co., Middletown, Ohio (0.00)
1—National Vulcanized Fibre Co., Yorklyn, Del. (0.00)

Group D

1—Fraser Companies Ltd., Newcastle, N. B. (0.00)
1—Price Bros. & Co. Ltd., Jonquiere, Que. (0.00)
1—Certain-Teed Products Corp., Savannah, Ga. (0.00)
1—Certain-Teed Products Corp., East St. Louis, Ill. (0.00)
1—Container Corp. of America, Los Angeles (0.00)
1—Allied Chemical & Dye Corp., Elizabeth, N. J. (0.00)
1—Bartgis Bros. Co., Ilchester, Md. (0.00)
1—U. S. Gypsum Co., Oakmont, Pa. (0.00)
1—Container Corp. of America, Chattanooga, Tenn. (0.00)

Group E

1—Lloyd A. Fry Roofing Co., Portland, Ore. (0.00)
1—Lloyd A. Fry Roofing Co., Compton, Cal. (0.00)
1—Riegel Paper Corp., Hughesville Mill, Riegelsville, N. J. (0.00)
1—U. S. Gypsum Co., North Kansas City, Mo. (0.00)
1—Lloyd A. Fry Roofing Co., Brookville, Ind. (0.00)
1—Lloyd A. Fry Roofing Co., Jacksonville, Fla. (0.00)
1—Lloyd A. Fry Roofing Co., North Kansas City, Mo. (0.00)
1—Lloyd A. Fry Roofing Co., Memphis, Tenn. (0.00)
1—The Flintkote Co., Mt. Carmel, Ill. (0.00)
1—Kimberly-Clark Corp. of Canada Ltd., Kapuskasing, Ont. (0.00)
1—Container Corp. of America, Wilmington, Del. (0.00)
1—Volney Felt Mills, Fulton, N. Y. (0.00)
1—Johns-Manville Products Corp., Tilton, N. H. (0.00)
1—The Logan-Long Co., Almalgamated Roofing Mills Div., Chicago (0.00)
1—Munroe Falls Paper Co., Munroe Falls, Ohio (0.00)
1—International Paper Co., Livermore Falls, Maine (0.00)

Division II—Paper Converting

Paper Bags

1—St. Regis Paper Co., Los Angeles (0.00)
1—Thilmany Pulp & Paper Co., Kaukauna, Wis. (0.00)
1—St. Regis Paper Co., Vancouver, B. C. (0.00)
1—Pillsbury Mills Inc., Wellsburg, W. Va. (0.00)

Boxes and Cartons

Group A

1—Container Corp. of America, Chattanooga, Tenn. (0.00)
1—Bartgis Bros. Co., Ilchester, Md. (0.00)
1—Container Corp. of America, Rock Island, Ill. (0.00)
1—Container Corp. of America, Folding Div., Manayunk, Philadelphia (0.00)

Group B

1—Container Corp. of America, Cleveland (0.00)
1—Gaylord Container Corp., Atlanta, Ga. (0.00)
1—Container Corp. of America, Knoxville, Tenn. (0.00)
1—Container Corp. of America, Baltimore, Md. (0.00)
1—National Container Corp. of Indiana, Aurora, Ind. (0.00)
1—Container Corp. of America, Greensboro, N. C. (0.00)
1—Gaylord Container Corp., Beaver Falls Pa. (0.00)
1—Bay West Paper Co., Green Bay, Wis. (0.00)
1—Mott Carton & Paper Co., St. Louis (0.00)
1—Hankins Container Co., Little Rock, Ark. (0.00)

Roofing Paper

1—Ruberoid Co., Gloucester, N. J. (0.00)
1—Lloyd A. Fry Roofing Co., Detroit (0.00)
1—Lloyd A. Fry Roofing Co., Stroud, Okla. (0.00)
1—Johns-Manville Products Corp., Los Angeles (0.00)
1—Lloyd A. Fry Roofing Co., York, Pa. (0.00)
1—Lloyd A. Fry Roofing Co., Robertson, Mo. (0.00)
1—Lloyd A. Fry Roofing Co., San Leandro, Cal. (0.00)

Insulation and Building Board

1—Abitibi Power & Paper Co. Ltd., Sturgeon Falls, Ont. (0.00)
2—Johns-Manville Products Corp., Jarratt, Va. (1.97)
3—Minnesota & Ontario Paper Co., Insulite Div., International Falls, Minn. (2.50)

Specialties

1—Scott Paper Co., Sandusky, Ohio (0.00)
1—Lily-Tulip Cup Corp., Chicago (0.00)
1—Line Material Co., Sherman, Texas (0.00)
1—Mid-West Wax Paper Co., Fort Madison, Iowa (0.00)
1—Lily-Tulip Cup Corp., Monticello, Ind. (0.00)

Division III—Pulpwood Logging

1—Southern Advance Bag & Paper Co. Inc., Hodge, La. (14.69)
2—St. Anne Power Co., Beaupre, Que. (36.72)
3—Abitibi Power & Paper Co. Ltd., Sault Ste. Marie, Ont. (41.51)

Southern Association to Meet in April; Three Mill Visits Planned

The annual meeting of the Southern Pulp & Paper Safety Association will be held April 4-6 at the Frances Hotel in Monroe, La.

In addition to a full program of speakers, discussions and demonstrations, the three-day event will feature mill visits to the plants of Brown Paper Mill Co. Inc. at Monroe, Southern Advance Bag & Paper Co. Inc. of Hodge, and Crossett Paper Mills at Crossett, Ark.

PATENT REVIEWS

MELVIN NORD*

Machine for producing corrugated paper

U.S. 2,686,555, issued Aug. 17, 1954, to Wilford Howard and assigned to Central Fibre Products Co. Inc., describes a machine for producing corrugated paper.

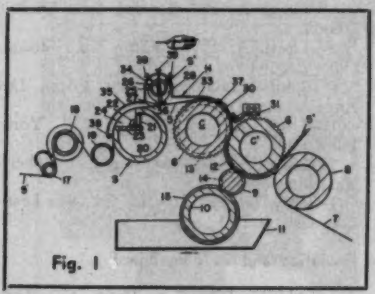

Fig. 1

The machine shown in Fig. 1 includes a first corrugating roll C and a second corrugating roll C' intermeshing with it, the two rolls being rotated in opposite directions about parallel axes, the second roll C' being slightly below the first. The corrugating rolls C and C' are preferably hollow, as shown, so that steam may be passed through to maintain the rolls at a temperature of 330 to 355°F. The stock 5 passes around the top of the first roll C and then between the rolls C and C', the corrugations being formed by the intermeshing corrugations 6. The stock 5 will then become a corrugated layer 5', and stock 7, to provide a liner for the corrugated layer 5', is fed to the opposite side of the corrugated layer 5', to which glue or any other adhesive has already been applied, as by a glue transfer roll 9 and also with a glue roll 10, which rotates in a bed of glue contained in a glue pan 11.

The corrugation stock 5 is fed to the machine from a roll, to pass beneath a guide roll 17, then over a driven feed roll 18, and then under an idler roll 19 before passing over a lower shower S and beneath an upper shower S', and then passing over the first corrugating roll C and between the rolls C and C'. The lower shower S is of the so-called "Gaylord" type. The upper shower S' is a so-called "pipe shower". Steam is applied to the corrugation stock from both showers.

The machine is also provided with a novel hood H, which serves to distribute the steam over a greater surface of the corrugation stock, and causes the stock to continue to be heated until it is partly around the corrugating roll C. The hood H acts also as a guide for inserting stock 5 into the machine, since stock fed around idler roll 19 will tend to be forced against the lower shower S, and when moving further into the machine, will be guided onto the corrugating roll C by fixed section 33, and then between the rolls. In addition, the hood H tends to cause a collection of condensate which might otherwise produce wet spots. The addition of the hood H to machines now in use is relatively easy, and the movable section 35 permits adequate inspection of and access to the lower shower S.

*Patent attorney, 17600 Pinehurst, Detroit 21

Sizing paper

U.S. 2,684,300, issued July 20, 1954, to William S. Wilson and Albert H. Bump, and assigned to Monsanto Chemical Co., relates to improved sizing methods, and particularly to the use of aqueous dispersions capable of markedly increasing the efficiency of ordinary rosin dispersions in the engine sizing of paper pulp.

The methods of the invention are carried out in general by first adding to the beater a predetermined amount of pulp in the form of a dilute aqueous suspension, after which a dilute aqueous dispersion of rosin which has been at least partially neutralized with caustic alkali, soda ash or the like, is added in an amount sufficient to supply from ¼ to 4 per cent of rosin based on the weight of the dry pulp used. A dilute aqueous dispersion of the reaction product of rosin with maleic anhydride, which product has also been at least partially neutralized with alkali, is then added, preferably in an amount sufficient to supply between 20 and 50 per cent of the reaction product based on the weight of the rosin employed. The dispersed mixture of rosin and resinous reaction product contained in the pulp is then fixed to the pulp fibers by adding a small amount of aluminum sulfate to the beater and thoroughly mixing the same with the treated pulp suspension.

High wet-strength paper

A paper having a higher wet strength, fold endurance, dry burst strength and resistance to liquid penetration is obtained by incorporating melamine-formaldehyde resin and oxidized guar in a pulp slurry prior to the preparation of paper.

The method is described by Donald R. Spear in U.S. 2,685,508, issued Aug. 3, 1954, and assigned to Eastman Kodak Co.

Recovery of Sulfate Ash from Wood Pulp Recovery Furnace Gases

U.S. 2,689,019, issued Sept. 14, 1954, to Lawrence M. Roberts, Alexander N. Crowder, and Samuel Rabkin, and assigned to Research Corp., describes a method and apparatus for recovering sulfate ash from wood pulp recovery furnace gases.

After the weak black liquor has been concentrated by multiple-effect evaporation, it is burned to produce ash. The ash is electrically precipitated from the gases resulting from the burning operation. The collecting electrodes are vibrated, permitting the particles to fall by gravity directly into a body of pulp digesting liquor.

As shown in Fig. 2 the precipitator is

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Bottle Carrier	Atlanta Paper Co.	2,685,909	8/10/54
Receptacle with detachable compartments	Aaron Berko	2,686,000	"
Knockdown box	Morris Paper Mills	2,686,001	"
Tapered collapsible carton	Bloomer Bros. Co.	2,686,002	"
Bottle carrier	Atlanta Paper Co.	2,686,003	"
Bag or sack	Irvin A. Reiss	2,686,004	"
Protection of paper stock against slime	Buckman Laboratories Inc.	2,686,119	"
Process of loading cellulosic fibers	Morton Chemical Co.	2,686,121	"
Improved refined wood pulp	Rayonier Inc.	2,686,131	"
Preparation of resin-bearing fibrous pulp	Keyes Fibre Co.	2,686,141	"
Cutter bar for a refiner	The Black-Clawson Co.	2,686,460	8/17/54
Synchronized stock control device	John W. Bolton & Sons Inc.	2,686,462	"
Automatic deckle edge separating press roll section	Beloit Iron Works	2,686,463	"
Paper shredder and press	Filemon T. Lee	2,686,466	"
Carton with locking slide and tray	The Ohio Boxboard Co.	2,686,627	"
Egg shipping case	Waldorf Paper Products Co.	2,686,628	"
Collapsible carton	Bloomer Bros.	2,686,629	"
Paper splicing	The Institute of Paper Chemistry	2,686,748	"
Machine and method for making valve bags	Kraft Bag Corp.	2,687,066	8/24/54
Method of making article carriers	Morris Paper Mills	2,687,067	"
Carton sealing apparatus	Owens-Illinois Glass Co.	2,687,068	"
Method and apparatus for conditioning pre-slit carton blanks	General Package Corp.	2,687,069	"
Hydraulic log barking apparatus	Sydney Hansel	2,687,152	"
Collapsible paperboard carrier	Container Corp. of America	2,687,247	"
Device for forming paper yarn	The Cellucord Corp.	2,687,299	"
Process of refining hardwood pulp	Brown Co.	2,687,352	"
Method of controlling the density of pulp insulation	Western Electric Co. Inc.	2,687,677	8/31/54
Feeding device for pulp making machinery	American Defibrator Inc.	2,687,816	"
Collapsible hollow wall carton	Harry E. Gray	2,687,839	"
Container structure	Purpa Containers Ltd.	2,687,840	"

divided into two precipitating chambers A and B operating in parallel. The flue gases flow downwardly through the inlet passage 65, as shown by the arrows, reverse direction around the bottom edge 64 of the baffle 63, flow upwardly through the precipitation chamber B and then pass out of the top of the precipitator through the outlet pipe 67. A similar baffle 68 on the opposite side of the precipitator directs flue gases from the inlet pipe 69 downwardly through the inlet passage 70 and around the bottom edge of the baffle 68. These gases flow up through the precipitator chamber A and are exhausted through outlet 71 at the top of the shell.

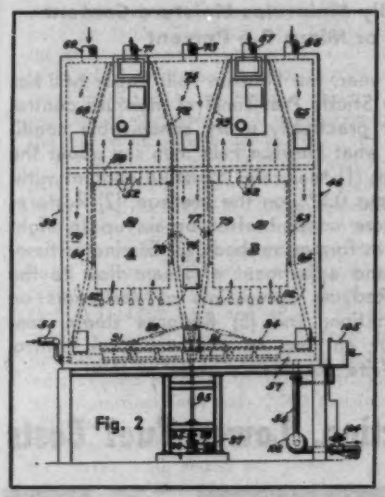

Fig. 2

A pair of similar vertical baffles 72 and 73 provide a central gas inlet passage 74 fed from inlet pipe 75. The flue gases pass downwardly through the central inlet passage 74 and divide and turn under the bottom edges of baffles 72 and 73 and pass upwardly through the precipitator chambers A and B to the respective outlet pipes 71 and 67.

Precipitated material is removed from the plates by vibrating the plates, using conventional vibrators 76 and 77 mounted on the baffles 72 and 73 respectively. Vibration of the electrodes may be performed continuously or intermittently as may be indicated by the particular conditions of precipitator operation.

Precipitated ash falls from the electrodes into the sump 57 and is dissolved in the pool of weak black liquor maintained in it. The sump is provided with an agitator 84. The agitator has a vertical shaft 85 extending from below the bottom of the precipitator.

Weak black liquor flows from the line 55 to the sump 57. The rate of admission of weak black liquor to the sump is controlled in accordance with the build-up of concentration of liquor in the sump.

Fortified black liquor leaves the sump by way of outlet pipe 54, pump 102 and outlet control valve 103. Valve 103 is operated by a controller 104 that is responsive to the level of liquor in valve control tank 105.

The fortified black liquor is added to the concentrated black liquor flowing to the recovery furnace.

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ADVANTAGES—Ferrolite hardens like stone and can be used 2 to 4 hours after being laid. It is water-proof, jointless, elastic, easy to walk on. Both the anti-slip and polished finishes are available in either STANDARD or ACID PROOF FERROLITE.

APPLICATION—"Standard" Ferrolite is ideal for all industrial floor applications, wherever heavy traffic demands a heavy-duty floor.

"Acid proof" Ferrolite floors are especially suited for paper mills, chemical plants, acid processing plants, in fact wherever chemicals or acids combine with heavy concentrated floor loads to create a flooring problem.

It is laid in varying thicknesses of ¾" to 1½" from a thermo-regulated mobile power unit especially designed in Europe for the application of hot colored mastic floor mixes, and it is now available through Fulton Asphalt Co., exclusively, for the first time in this country.

QUALITY CONTROL—Fulton Asphalt Co., specialists since 1870 in quality flooring, has built a special laboratory to insure quality control and uniformity of Ferrolite.

INSTALLATION—All installations are made under the supervision of S. O. Siewert, C. E. who has become a member of the Fulton Organization. He is a European expert in the highly specialized field of FERROLITE Hot Mastics in colors to withstand heavy concentrated floor loads. Let us tell you more about FERROLITE and how it can save flooring costs in your plant. See how reasonable a new, heavy-duty, beautiful floor in color can be.

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STICKLE NEWS

Stickle Equipment
Cuts the cost of steam

Published by Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Indiana

Newton Falls Paper Mill Reports on Stickle Moisture Control System

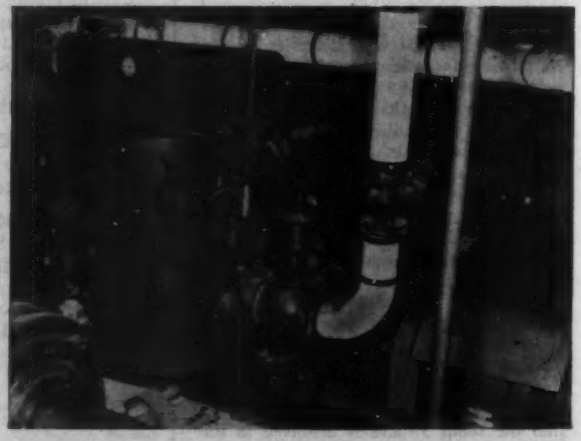
Automatically Maintains Moisture Content Within Plus or Minus 0.5 Percent

For the past year, the Newton Falls Paper Mill has operated the Stickle Pres-Ten-Trol moisture control system under practically every conceivable condition. Here is what Newton Falls men say about the Stickle system: (1) Maintains moisture content within plus or minus 0.5% on the average, (2) Restores proper moisture content after breaks up to eight times as fast as former methods, (3) Eliminates time-consuming hand adjustment of steam flow to the dryers, (4) Reduces complaints of customers on moisture variation, and (5) Reduces steam consumption. Put an end to your moisture control problems. Write for Stickle bulletin 360-C.

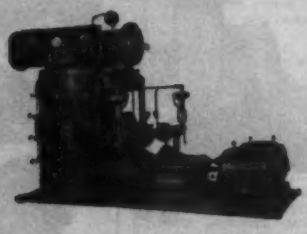
Drainage System Guaranteed to Increase Production, Lower Fuel Costs

Mills Report Dryer Capacity Up 20 to 30%; Fuel Costs Down 10 to 15%

Mill after mill reports higher production and lower fuel costs after installing the Stickle Vacuum Differential Drainage System. Here is an example in one mill, the No. 4 machine was running at 590 to 600 f.p.m. at a drying pressure of 12 to 15 pounds. Attempts at higher speeds resulted in cockled paper and by-passed steam traps. After installation of the Stickle system, speed was increased to 750 to 800 f.p.m., at a drying pressure of 8 to 10 pounds — with no cockling and no traps by-passed. Main unit of the drainage system is the vacuum pump shown at right. Send for free bulletin 260. For paper board mills, the Stickle Differential Drainage and Boiler Return System (Bulletin 160) is recommended.

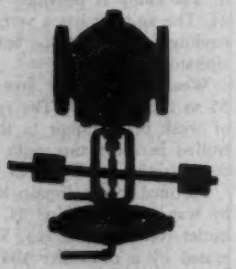


"X-Ray" view of the Stickle Open Coil Deaerating Feed Water Heater . . . guaranteed to heat more water to higher temperature in less space than any other heater at any price. Capacities: 5,000 to 300,000 pounds per hour.



The Stickle Vacuum Pump is main unit of the Vacuum Differential Drainage System. Single and duplex models. Capacities up to 300 GPM (water) and 290 CFM (air); or 900 GPM (water only).

Stickle Visible Micro Adjustable Orifice permits accurate modulated temperature control on dryers with visible operation. Eliminates steam losses due to excessive "blowing through" into return lines.



Stickle Automatic Differential Valve controls exact differentials in pressure between two sections of paper machine, assuring proper drainage at all pressures.

FOREIGN ABSTRACTS

Slabs and edgings from sawmills in Norway

In studying the supplies of possible raw materials for the Norwegian pulp industry, the Central Bureau of Statistics compiled data on the production and utilization of slabs and edgings obtained from the sawmills in 1953. The study was limited to the more important forest regions and was based on information given by 1,053 of these mills, thus representing about 92 per cent of the sawn goods production in the regions included in the survey.

The production of slabs from which the bark has been removed was 736,000 "piled" cu. m. Unbarked slabs amounted to 390,000 cu. m. Of the former, 556,000 cu. m. were routed to the pulp and fiberboard industries; 26,000 were delivered to other industries, 110,000 were used as fuel, and 44,000 were not utilized. Of the unbarked variety, 44,000 cu m. went to the pulp and fiberboard industries, 22,000 were utilized by other industries, 302,000 were burned as fuel, and 22,000 remained unutilized.

A map of Norway shows the extent of the survey, and details are given in appropriate tables and graphs. Arne L. Aaseth, *Norsk Skogindustri*, 8, No. 11, 367-79 (1954) (original in Norwegian, with English summary).

Transport plates for hard wallboard

Transport plates used in producing hard wallboard are at times deformed in service and then cause operating difficulties. Deformation usually consists of a length and crosswise compression of the central portions of the plates, which are clamped tight in the press with the wallboard sheet during the pressing operation. Edges that are not compressed buckle and form a wavy fringe.

Deformation occurs when the compressive forces (which are set up by the restricted thermal expansion of a cold plate that is tightly clamped in a hot press) exceed the "yield strength" of the material. Compression is found to be greatest when the press is charged with plates that are colder than normal, e.g., after a week-end shutdown. The possibility of allowing cold plates to adjust themselves to the proper temperature by delaying the closing of the press after it has been charged is inexpedient, due to interference with normal operation.

When transport plates are made thinner than usual (i.e., 3 mm.), their strength should be increased proportionately in order to permit the plates to expand without yielding during the low-pressure venting period of the pressing cycle. Some non-compressed plates become wavy over their entire area, a phenomenon probably caused by uneven relief of internal stresses during the pressing operation. Therefore, transport plates should be stress-relieved, and the final straightening operation should be as gentle as possible.

There are also instances in which plates become brittle with tendencies toward cracking, probably because of strains in aging. However, this embrittlement is seldom critical; the added strength given in aging may actually help to conserve plates that might otherwise fail.

It is recommended that plates for hard wallboard manufacture should be delivered in a stress-relieved condition, with a minimum yield strength of 33 kg. per sq. mm. in the case of 3 mm. plates. When plate thickness is reduced below 3 mm., the yield strength should be increased proportionately. Bernt Roald and Knut Krogstad, *Norsk Skogindustri*, 8, No. 11, 380-2 (1954) (original in Norwegian, with English summary).

Pulpwood floating losses in the Kemi River, in Finland

In 1954, the Forest Work Study Section of the Central Association of Finnish Woodworking Industries cooperated with the Kemijoki Floating Association in a study of the floating losses of two-meter length, partially barked spruce and pine pulpwoods in Northern Finland.

There were 42,760 spruce logs (in six groups) and 38,894 pine logs (in eight groups), and these represented about 0.7 per cent of the total pulpwood floated. The logs were spray-painted at either end and marked with group numbers. Launchings were made between May 7 and June 4, and the sorting was over at the end of August. The floating time weighted by the number of logs in the series arriving from the lower parts of the floatway varied from 26 to 51 days; and that of the series arriving from the upper parts varied from 78-81 days. Weather conditions were quite favorable. The logs were stored in stacks, mostly on the banks of rivers and brooks, but in part on a frozen lake (cf. accompanying figure).

Pulpwood stacked on frozen lake

In terms of the *number* of logs, the floating losses averaged 3.75 per cent for spruce and 3.15 per cent for pine. Although the times of barking had varied considerably (from early 1952 to April, 1954), no essential differences were noted because of this divergence. The volume of the spruces lost was so much smaller than that of the pines that the floating loss in terms of cubic meters showed less divergence. Thus, the losses per cubic meter were 4.69 per cent for spruce and 4.96 per cent for the pine logs.

Sinking was a factor in these losses *only* when the pulpwoods had been barked in September and October of the *preceding year, or later*. For the older barked wood, the floating losses were attributed presumably to drifting ashore, to dynamiting and to theft, a view supported by the fact that the pulpwood lost was above normal size. The floating loss computed on the basis of this test material corresponded to the losses gaged from cooperative sorting. Evidently, errors in measurement had had no great effect.

Exceptionally unfavorable seasoning factors may lead to high floating losses. As an example, a lot of spruce pulpwood barked in November, 1953, and then launched on May 7, showed the high loss of 13.5 per cent logs—a loss due largely to sinking. Arno Tuovinen, *Paperi ja Puu (Paper and Timber, Finland)*, 36, 453-457 (1954) (original in Finnish, with English summary and captions).

Brightness determinations on bleached pulps

This is a comprehensive report of the cooperative work done in several laboratories by the Analytical Committee of the Central Laboratory of the Cellulose Industry. The entire investigation is made with pulps bleached to at least 80 per cent G. E. brightness. Before developing the methods, the following factors are considered: water to be used in sheet making, mode of disintegrating the pulps, pH, "sheet machine" (actually a Buchner funnel was used successfully), filter paper used in pulp filtrations, thickness of the pulp sheet, wet-pressing, drying, dry pressing of the sheet, and brightness measurements.

The study is intended to answer the following questions: (a) Does the method give reproducible results in one and the same laboratory? (b) Does the method lead to the same result in different laboratories? (c) Are the sheets suitable for

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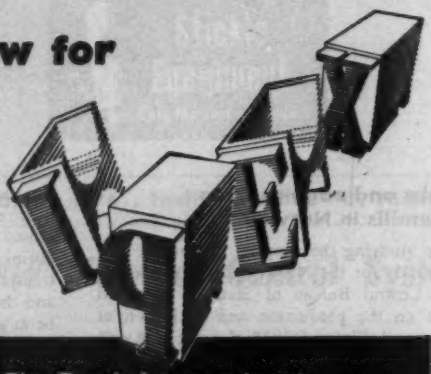

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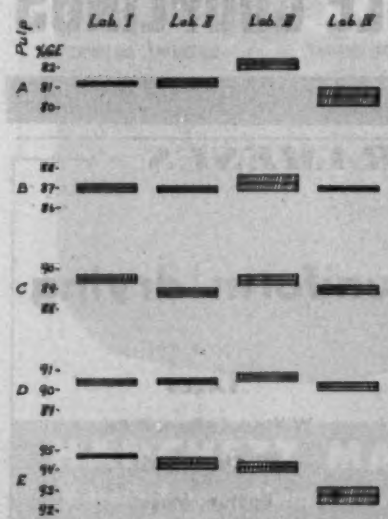
measurements using instruments of different design?

The tests are carried out with a kraft pulp bleached conventionally (A), a kraft pulp bleached with chlorine dioxide (C), a sulfite pulp bleached conventionally (B), a viscose sulfite pulp (D) and also a hardwood sulfite (E) bleached with chlorine dioxide. From each of these, 12 "brightness sheets" are made in four different laboratories. These are first measured by the parent laboratory. They are then sent to Laboratory I, where the brightness is measured on the third day in a Zeiss Elrepho (using both filters 6 and 7). On the sixth day, Laboratory II makes measurements with Hunter and Photovolt instruments. Then, a fifth laboratory (that had taken no part in the actual sheet formations) on the ninth and tenth days measures the brightness of the sheets with a Hunter and a G. E. apparatus. Finally, the sheets are returned to the parent laboratory; and the brightness is measured again, about 14 days after the initial measurements. Thus, the brightness before and after circulation can be determined.

The calculations that are made are given fully, and the results are tabulated in great detail. The dispersion of brightness measurements between single sheets and the dispersions of averages of double tests are also given. Results indicate that the sheet forming methods are equally suitable for all the instruments used in the study. The results (while not foolproof) show high reproducibility within each laboratory and good agreement between different laboratories.

As a matter of interest, a comparison is made between the brightness of laboratory sheets and that of machine-dried sheets made from the same pulps—both at the outer surfaces and on an inner surface after splitting the sheet. The results, while not entirely comparable, show marked



Averages and standard deviations

similarities (especially in the case of the [so-called] "internal surface" and the laboratory sheets). Seven tables and seven figures (of which only one is reproduced herewith) are given. The data are compiled by Christian Valeur. *Svensk Papperstidn.*, 57, 789-800 (1954) (in English).

Paper properties that favor rust formation

The authors study the precision of rapid methods for determining the acidity and the chloride content of papers, both of which favor rust formation when present in papers that make contact with iron. Finely divided paper samples are extracted for one hour with hot water and then tested both for pH and for acidity, by means of Congo red paper. (The latter has to be freshly prepared in the laboratory, because commercial samples are found to be unsuitable). Papers with a pH below 6 induce the rusting of an iron plate (cleaned with emery paper and wrapped in the test paper).

As a control, filter paper is used, and, in either case, tests are carried out at 25° C. and 92 per cent relative humidity. Ordinarily, 0.5 per cent or more of sodium chloride in paper also causes rusting more rapidly than does the filter paper. The chlorides are determined by Winklers method (*Z. anal. Chem.*, 53, 359 [1914]). Usually, the same samples that cause rusting of iron also attack metal clips. Gerhard

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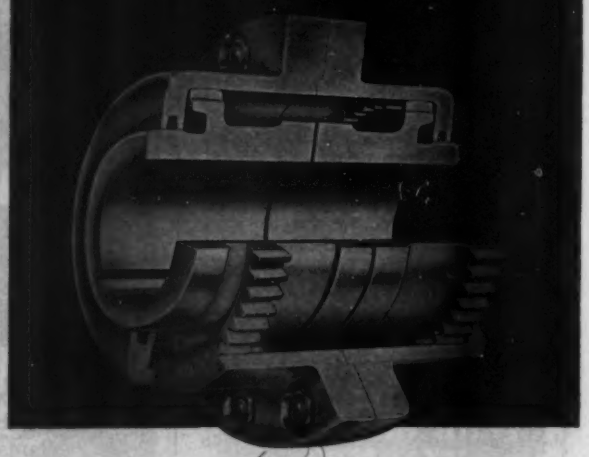

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Foreign Abstracts . . .

Schikorr and Kurt Volz, *Das Papier*, 8, 431-4 (1954) (in German).

Study of instruments used in rapid determination of moisture

Four different instruments used in determining moisture in paper sheets are studied and the results compared with those obtained by the direct drying method (at 105°C.). The control instruments are: the Mahlo Textometer, the Mundinger Feuchtigkeitsmessagerat, the Hart Moisture Meter, and the Lippe Hygrotester. Of these, the first three utilize the principle of electrical resistance, whereas in the fourth, the dielectric constant is determined and the per cent of water calculated.

The authors investigate the effects on the moisture determination of the type of fiber in the sheet, the filler, the basis weight, the degree of beating (*i.e.*, the slowness of the pulp), as well as the part played by rosin and alum in sizing.

A series of graphs are given, showing what corrections may be required as a result of these variable factors. For example, the *amount* of a filler may exert a significant effect on the dielectric constant, whereas the actual *type* of the filler may play no important role. Neither the rosin nor the alum has a significant effect on the dielectric constant, but the basis weight, degree of hydration, and the kind of fiber used all have to be considered in calibrating the Hygrotester.

All measurements are made on carefully prepared handsheets, not on the running paper web. When appropriately calibrated (by the use of suitable graphs), each of the four instruments proves entirely suitable for rapidly determining moisture—giving, in all cases, a precision of 0.3 to 0.4 per cent. The authors also outline the construction and the working principles of each instrument. Walter Brecht and Ludwig Körner, *Das Papier*, 8, 247-58; 419-30 (1954) (in German, with a very brief English summary).

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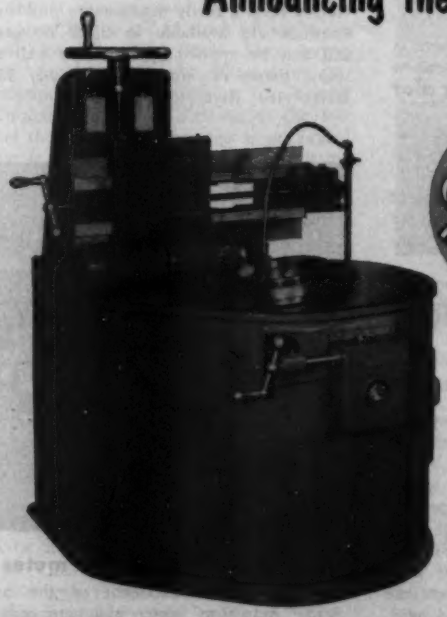

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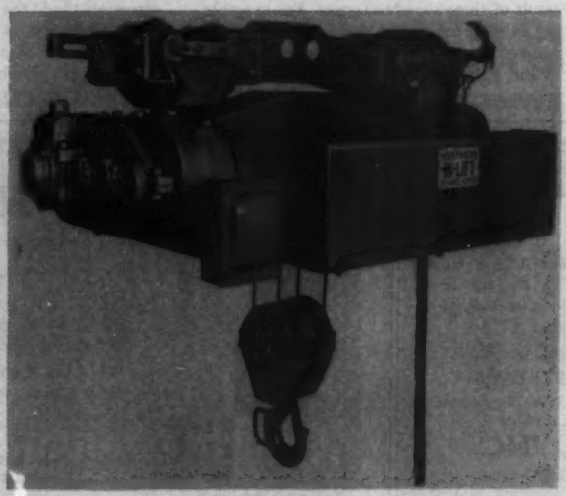
NEW PRODUCTS

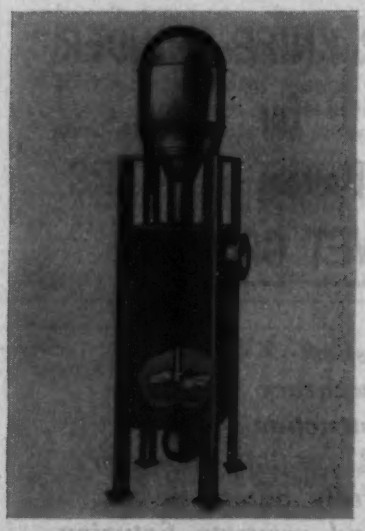
Electric hoist for continuous service



A new heavy-duty "Hi-Lift" electric hoist, designed for use where the service is continuous and severe, is now on the market. This new hoist is built in capacities from three to 15 tons. It is equipped with double four-wheel swiveled trucks to distribute the load on the supporting track and reduce the wear on truck wheels and track.

Both hoist and trolley travel are controlled either by a pendant push button or from an attached operator's cab. Heavy-duty ac or dc motors and full magnetic control are furnished.

The hoist is designed with an all-steel frame, heavy-duty roller bearings, hardened steel gears, large drum and sheaves. According to the manufacturer, every consideration is given to severe service requirements in the construction of this hoist. *Northern Engineering Works,* 210 *Chene St., Detroit* 7, *Mich.*



Defibering machine

A new machine, the "Selective Defiberizer," using the patented high-speed impeller, defibers screen rejects quickly and efficiently so that they will pass through the openings in the reject screen and return to the system. The new machine will not touch waste, such as cellophane, match sticks, tin foil or rubber bands, and will not shorten fibers, it is claimed. Since there is no mechanical grinding action or metal to metal contact, there is little hydrating effect on the cellulose fibers themselves.

The new machine is designed for continuous flow operation. A single impeller runs freely in stock to knock down undefibered screen rejects. The manufacturer claims that little maintenance is required because of its simplicity and rugged construction.

Tests will be run and specific recommendations made for paper manufacturers at no charge. *Cowles Co., Inc., Cayuga, N. Y.*

Ball bearing trolleys

A new line of ball bearing trolleys for overhead conveyors, known as Series 500, has been developed.

The new trolleys are rugged and simple in design and are engineered to provide rolling contact with the tract at all positions. Bearings with ball and cage assembly and concentrically ground raceways keep friction at a minimum. The wheels are steel; their treads are machined and hardened to give maximum life. The brackets are of forged steel. Labyrinth seals are normally furnished in the trolleys, but other types can be provided. The trolleys have a large lubricant storage space and a pressure-type grease fitting.

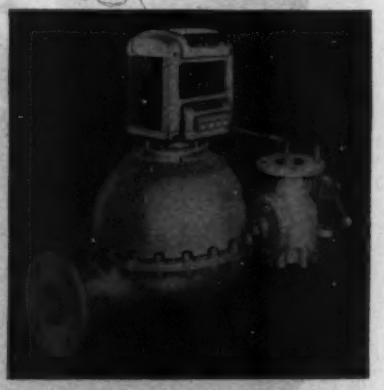
All three sizes of the Series 500 trolleys are interchangeable with most other trolleys commonly used with rivetless conveyor chain. The attachments commonly used to adapt the trolleys as carriers for a specific article are also interchangeable.

Series 500 trolleys are available in two types: the bolted wheel and bracket assembly, for ease of assembly and disassembly; and riveted, for permanent assembly of wheel and bracket. *Link-Belt Co., Dept. PR,* 307 *N. Michigan Ave., Chicago* 1, *Ill.*

Liquid neoprene coating

A new "self-curing" liquid neoprene coating with oustanding resistance to corrosion has been announced. This liquid neoprene is recommended for the protection of new or old equipment and structures, whether made of metal, wood, or concrete, against splash, fume or spillage of non-oxidizing inorganic acids, alkalies, inorganic salts and most polar solvents.

Liquid neoprene is also effective where chipping and abrasion due to rough handling make the use of ordinary paints impractical. The rubbery texture and high thickness per coat provide extended service life and make the coating ideal for applications where frequent repainting has previously been a costly maintenance problem. Coatings are available in black or gray and may be applied by brush, as well as spray. *Emjay Maintenance Engineers,* 327 *Union Ave., Rutherford, N. J.*



Automatic liquid control meter

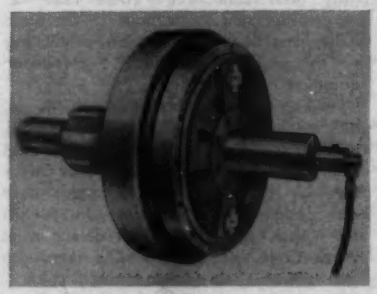
With the announcement of the new 3 in. "Auto-Stop" meter, automatic control of water and other liquid ingredients fed to batching and blending processes is now extended to rates of flow as high as 300 gpm, it is claimed.

The new meter features a double-trip or "cushioned" "Auto-Stop" valve that slows down the rapid flow of the liquid

an instant before it trips shut. According to the manufacturer, this permits extremely accurate cut-off with no hydraulic hammer.

The numerals on the face meter provide a visual check of the flow. Flow can be stopped instantly without affecting the meter reading or "Auto-Stop" setting by pressing the emergency stop button. The delivery can be continued to its conclusion by reopening the valve, or the register can be reset for a new quantity before continuing.

The meter is of the positive displacement, nutating piston type and is of bronze construction. *Neptune Meter Co., 19 West 50th St., New York 20, N. Y.*



Air clutch

A new air clutch, called the "Air-Grip," is said to establish new standards in quick action and ease of control. It responds instantly to a touch of the throttle because a minimum of air is used in the operation of the clutch. This sensitivity provides "finger-tip" control and an ability to "inch" the clutch or to throw it into full engagement, as required.

Instant disengagement of the clutch is achieved by the use of quick release valves built into the clutch itself. These valves are optional equipment. Engineering advancements include provision for internal ventilation. This, in addition to the fact that the flexible air seal disc is so located that it does not come in contact with the heat generating plates, results in cooler operation and longer life, according to the manufacturer.

Another feature is provision for mechanical engagement of the clutch in case the air supply fails. The clutch interchanges with and can be used to replace Dodge or other mechanical clutches in existing installations. It is available from stock in single and double plate models from 8.5 to 806 hp per 100 rpm at 80 psi. *Dodge Manufacturing Corp., Mishawaka, Ind.*

Constant flow valves

A new series of constant flow valves, said to maintain the rate of flow of fuel oil or any other non-abrasive fluid within 1 per cent up to 200, 300, 400, 500, 600, or 700 gph, is now available. Each model will maintain flow rates as low as 10 per cent of maximum, according to the manufacturer, who also states that the valves will regulate the flow of fluids with viscosities as high as 250 ssu at operating temperature, static pressures as great as 500 psi, and temperature as high as 250° F., despite fluctations in upstream or downstream pressure. Flow level is accurately maintained as long as the fluid viscosity and temperature are constant and the pressure differential across the valve is 40 psi or higher for maximum flow.

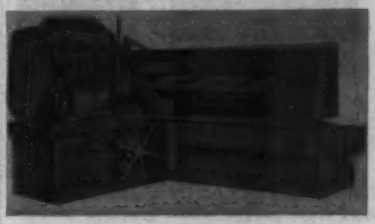
Flow level may be set manually at the valve or through any one of four optional remote adjusting systems specifically designed to operate in conjunction with the valve. These four systems—hydraulic, pneumatic, and two electric—may in turn be operated manually or by a pneumatic or electric signal proportional to temperature, flow of another fluid or gas, or some other variable. In addition, any one of these adjusting systems may incorporate a feedback potentiometer to develop a voltage proportion to flow through the valve. *Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.*

Braking controller

A compact dc braking controller no larger than a combination linestarter is now available in two sizes of enclosures for braking standard induction motors from ¼ to 25 hp. It will provide braking torques of as much as eight times full load running torque.

Operated from a single "start-stop" pushbutton, the new controller requires no adjustment after initial installation. Its main components are a selenium rectifier, contactors, transformer, and a timing circuit.

According to the manufacturer, the advantages of dc braking over mechanical braking are as follows: faster, more accurate stopping; no mechanical maintenance required; elimination of need for a double-shaft motor, and elimination of solenoid hum. In addition, dc braking has these reported advantages over other types of electrical braking: braking torque decreases rapidly as speed approaches zero, providing smoother, more accurate stops; motor cannot reverse; motor losses are relatively low, and no external motor resistance is required. *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*



Shear blade and face grinder

The new "Hy-Power" shear blade and face grinder is equipped with 30 or 36-in. diameter heavy-duty segmental grinding wheel chucks mounted to an extra-large diameter heavy-duty supporting flange. Machine ways are said to be extremely wide. The "V" ways are 3 in. wide and the flat way 3 in. wide.

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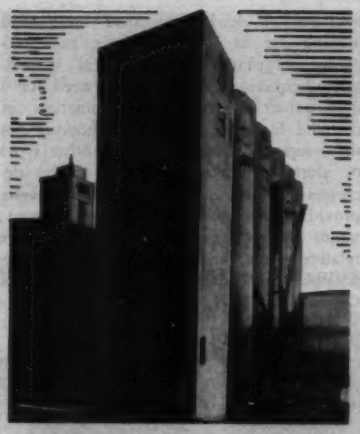

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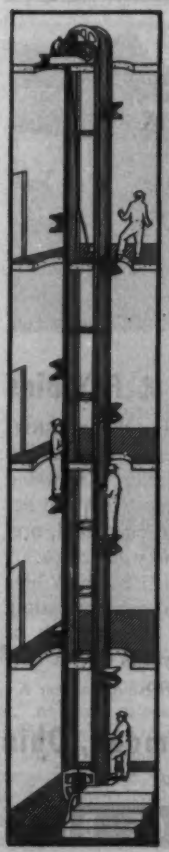

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volving knife bars are standard equipment with a choice of 10 or 12 in. work faces. They are operated through worm and worm gear mechanism with full 360° adjustment (graduated dial). Large angle plates for holding flat surface work pieces to be ground are also standard. All knife bars are ground and balanced for perfect alignment, according to the manufacturer. Clamping arrangements are available in manual, magnetic, hydraulic or air-operated types to suit individual production requirements. *Hanchett Mfg. Co., Big Rapids, Mich.*

Angle temperature regulator

A new line of angle Type T temperature regulators has been developed. These new regulators may be mounted directly on heat exchangers, instant water heaters, etc., that have inlet connections on the top, thus saving piping and installation labor.

The regulators have wearing parts of stainless steel or bronze that can be renewed. They have an "overrun" feature for protection of the thermal element in the event temperature at the bulb exceeds the range of the regulator. A two-ply bellows is used in the thermal unit for added power and longer life. *O. C. Keckley Co., 400 W. Madison St., Chicago 6, Ill.*

Semi-standard heat exchangers

A new line of semi-standard heat exchanger units designed to meet a wide variety of heat-transfer problems has recently been announced. These heat exchangers are said to be built to the same quality standards followed in fabricating the company's custom-built heat-transfer equipment.

Thickness of the tube sheets is ⅞ in. and up, and thickness of bonnets and channels is 3/16 in. Small stainless steel nozzles are schedule 40 stub ends, with ASA lap-joint flanges. The units have been designed for pressures of 150 psi and higher, and construction details meet ASME Code specifications. The units also meet TEMA Class C Standards.

Numerous optional design features may be specified. The nozzles, for example, may be of any size or in any location required by the installation. Units may be specified with or without an expansion joint. The semi-standard units are available in stainless steel or carbon steel. Other

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alloys are also available. Standard shell diameters available are 5, 6, 8, 10, 12, 14, or 16 in., in various lengths in each size. Construction may be 1 pass, 2 pass or 4 pass, and tube diameters may be 5/8, 3/4 or 1 in. *Downingtown Iron Works, Inc., Downingtown, Pa.*

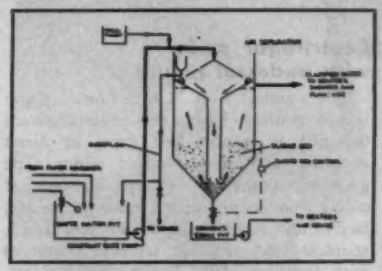
Variable speed drive

The new "Speed Variator" is a simple compact drive that provides infinitely variable output speed over a 9:1 range from a constant speed power source. Based on the patented design of a Swiss engineer, the drive has been manufactured for several years in various European countries. Redesigned to meet the exceptional demands of American industry for ruggedness and dependability, this new drive requires a minimum of maintenance and service, according to the manufacturer.

By employing the rolling action of a series of balls, this simple device permits smooth adjustment of output speed from 1/3 to 3 times the input speed while operating under load. The horsepower transmitting capacity of the drive depends on the size of the unit and the input speed selected. The drive thus chosen will handle its full power rating over the entire range of output speeds.

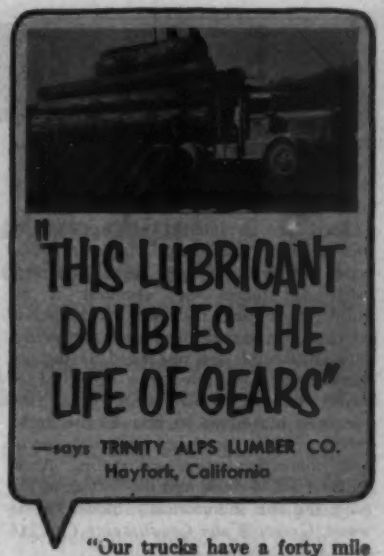
Coaxial input and output shafts rotate in the same direction, either clockwise or counterclockwise. There is ample bearing support for both input and output shafts to carry overhung pulleys. According to the manufacturer, high operating efficiency and required tractive force for all operating conditions are provided by a built-in torque-responsive mechanism.

The extreme simplicity of construction permits close speed regulation without complicated linkage and without drift. Speed can be regulated by a simple indicating manual adjustment or by manual or power operated remote control devices. Speed regulation is said to afford a very close approximation to geometric progression. *Cleveland Worm & Gear Co., Speed Variator Div., 3269 East 80th St., Cleveland 4, Ohio.*



White water reclaimer

A simple white water reclaimer without moving parts is now being offered. The machine's primary use is for those many white waters which are of such consistency, by virtue of the presence of weighting agents, that simple settling and gravity concentration of stock can be obtained by reducing



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New Products . . . . . .

the velocity of white water. White waters thus treated result in treated water effluent of 0.25-0.50#/1000 gals. stock concentration.

There are no internal moving parts in this machine. Incoming white or waste water merely flows over an air-separator baffle and mixes with chemical, if required, in a long, high-velocity downtake, which projects into the bottom cone. Accumulated solids are suspended by the upflowing water to provide a deep bed of sludge through which waste water and chemicals must pass to flow to the outlet collector. This produces optimum conditions for concentration and settling. Accumulated solids settle into the bottom of the cone and are automatically blown off to waste. *Graver Water Conditioning Co.*, 216 *W. 14th St., New York* 11, *N. Y.*

¾-yard shovel-crane with power hydraulic control

"Speed-o-Matic" controls are available for the first time on heavy-duty 3/4-yard machines with the introduction of the "LS-88" shovel-crane. According to the manufacturer, this new machine offers the most speed and power in its class.

With power hydraulic "Speed-o-Matic" controls, it is claimed that all load handling and machine movements are smooth, safe, fast and precise. The movement of short-throw levers—meters pressure for full control of power for all machine functions, providing extra speed and minimizing end-of-shift operator letdown.

Because of its all-welded, stress-relieved construction, the new "LS-88" design is said to emphasize more "live" or earning weight in greater proportion to counterweight found on other rigs. According to the manufacturer, this greater advantage permits use of up to 91 net, or usable horsepower at the power take-off. *Link-Belt Speeder Corp., Cedar Rapids, Iowa.*

Centrifugal pump with pedestal mount

The stainless steel "Centri-Chem" pump is now available with a new pedestal mount designed to permit belt drive or direct coupling with any standard motor. The pedestal mount is a precision-finished single iron casting with a smooth, durable, heavy-duty double ball bearing unit and a stainless steel shaft in accurate alignment with the base plate. Thrust shoulders machined into the shaft rest on bearings that eliminate end thrust and take up the radial load. Reduced overhand permits the pump to be rotated in any position without obstruction by pedestal parts. Extra heavy pads provide vibration-free performance when the unit is mounted on a concrete or steel bed plate. *Eco Engineering Co.*, 12 *New York Ave., Newark* 1, *N. J.*

Emulsifiable polyethylene

Emulsifiable Type A-C polyethylene is now available in limited quantities for evaluation on plant run scale. It is reported that small particle size, stable, clear, high solids-content emulsions are readily obtained with this easily emulsified material. *Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.*

Officers Elected by APPA Divisions

AFFILIATED GROUPS and divisional associations staged annual meetings in conjunction with the four-day APPA convention in New York City February 21-24. Among major items on the agendas were the annual elections of officers.

Featured during many of these gatherings were annual reports of 1954-55 activities, while at numerous meetings members heard headline speakers from government and business discuss problems faced by the industry during the coming year. In almost every instance where a prediction was made the future was pictured as economically sound, with business continuing on a steady uptrend.

Principal officers (some reelected) chosen to serve these APPA affiliate groups during 1955-56 are as follows:

Writing Paper Manufacturers Association—President, J. H. Goodwin of International Paper Co.; vice president and chairman of the rag content paper group, Nelson Bridgham of Strathmore Paper Co.; vice president and chairman of the sulphite bond group, Harold Holden of Eastern Corp.; executive secretary-treasurer, M. C. Dobrow; assistant secretary, John F. Darrow, and assistant treasurer Miss Olive F. McGill.

Blotting Paper Manufacturers Association—President, Graham A. Carlton of Standard Paper Mfg. Co.; vice president, W. W. Langtry of the Wheelwright Div. of Mead Corp., and secretary-treasurer, Eric G. Lagerloef of the APPA.

Groundwood Paper Manufacturers Association—President, Samuel Pruyn of Finch, Pruyn & Co.; eastern vice president, John Cryan of Fraser Paper Ltd., and western vice president, Robyn Campbell of Minnesota & Ontario Paper Co.

Sulphite Paper Manufacturers Association—General chairman, Neil E. Nash of Nekoosa-Edwards Paper Co.; first vice chairman, James G. Conley of Fraser Paper Ltd.; bleached group chairman, E. M. McCourt of Consolidated Water Power & Paper Co.; unbleached group chairman, George Stuhr of the Southern Kraft Div. of International Paper Co.; manila group chairman, Wayne A. Brown of Crown Zellerbach Corp.; machine glazed group chairman, Neil E. Nash of Nekoosa-Edwards Paper Co., and bleached converting group chairman, Gilford F. Henderson of Brown Co.

Waterproof Paper Manufacturers Association—President, David E. Ryan of Edgewater Paper Co.; vice president, Walter Shorter of Camp Mfg. Co., and secretary-treasurer and administrative officer, Philip O. Deitsch. (The annual

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election was held several weeks ago in Chicago.)

Tissue Association—President, Wayne A. Brown of Crown Zellerbach Corp.; vice president, Milan Boex of the Northern Paper Div. of Marathon Corp.; treasurer, Clayton White of Pequannock Valley Paper Co., and executive secretary, Ross A. Fife Jr.

National Council for Stream Improvement—Chairman, George E. Dyke of Robert Gair Co. Inc.; vice chairmen, Clyde B. Morgan of Rayonier Inc. and W. Irving Osborne Jr. of Cornell Paperboard Products Co.; treasurer, W. E. Breitenbach of Rayonier, and executive secretary and assistant treasurer, Russell L. Winget.

Coated and Processed Paper Association—President, Louis C. Krauthoff of H. D. Catty Corp.; new executive committee members, Spurgeon F. Barndt of Wyomissing Glazed Paper Co., Lawrence R. Clark of Hampden Glazed Paper & Card Co. and Stephen Florio of Marvellum Co., and executive director, Arthur A. Thomas.

United States Pulp Producers Association—Regional directors, N. L. Nourse of Brown Co. (New England), P. H. Glatfelter of P. H. Glatfelter Co. (Middle Atlantic), F. H. Savage of International Paper Co. (South), Lyall Stilp of Kimberly-Clark Corp. (Lake States), and Lawson Turcotte of Puget Sound Pulp & Timber Co. (West Coast).

Bristol Board Group of the Writing Paper Manufacturers Association—Chairman, C. J. Dynes of the Hollingsworth & Whitney Div. of Scott Paper Co.; vice chairman, W. K. Graves of International Paper Co., and executive committee members, Richard Campbell of Linton Bros. & Co., Charles Nicol of Sorg Paper Co. and Grant Richardson of Hammermill Paper Co.

Vegetable Parchment Manufacturers Association—President, E. R. Leohard of Paterson Parchment Paper Co., and vice president, M. E. Moyer of West Carrollton Parchment Co.

Paper Napkin Association—Chairman, R. L. Fentsamaker of C. A. Reed Co.; vice chairmen, R. W. Bertram of Marathon Corp. and L. W. Moore of Crown Zellerbach Corp., and secretary-treasurer, Arlo Wilson.

Kraft Paper Association Inc.—President, H. S. Daniels of Union Bag & Paper Corp., and vice president, R. L. Vayo of St. Regis Paper Co.

Association of Pulp Consumers—President, Lane Taylor of W. C. Hamilton & Sons Inc. and Michigan Paper Co.; vice president, Samuel R. Stuphin of Beveridge Paper Co., and secretary- treasurer, Reed R. Porter.

American Pulpwood Association—President, L. J. Freedman of Penobscot Chemical Fibre Co.; vice presidents, W. J. Damtoft of Champion Paper & Fibre Co., G. B. Amidon of Minnesota & Ontario Paper Co. and E. B. Hurst of Consolidated Water Power & Paper Co.; executive secretary-treasurer, W. S. Bromley, and assistant treasurer, Helen L. Kohler.

Specialty Paper and Board Affiliates—President, Malcolm B. Lowe of Lowe Paper Co.; vice president, Carlton A. Denny of St. Regis Paper Co., and secretary-treasurer, G. D. Cook. (The annual election was held at the Waldorf-Astoria in January.)

Newsprint Service Bureau—President, A. G. Wakeman of Coosa River Newsprint Co., and vice president, M. C. McDonald of Great Northern Paper Co.

Paper Plate Association—President, Alfred Bleyer Jr. of Alfred Bleyer & Co., vice president, Thomas Ecclesine of Fonda Container Co., and secretary-treasurer, Ben B. Vail.

Glassine and Greaseproof Manufacturers Association—Chairman, W. A. Wylde of Deerfield Glassine Co.; vice chairman, B. R. Cancell of Rhinelander Paper Co., and secretary-treasurer, Thomas J. Burke.

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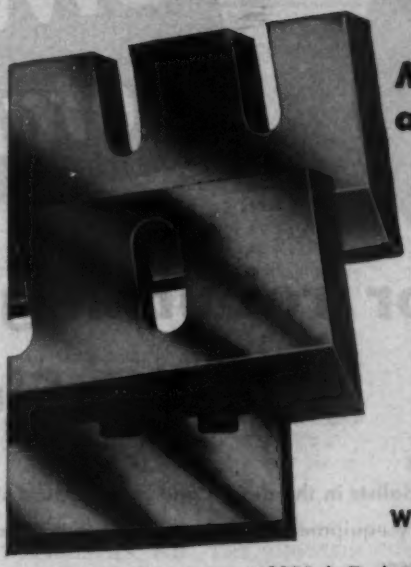

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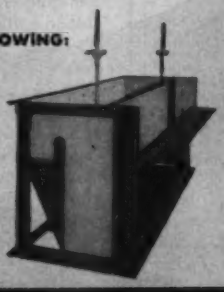

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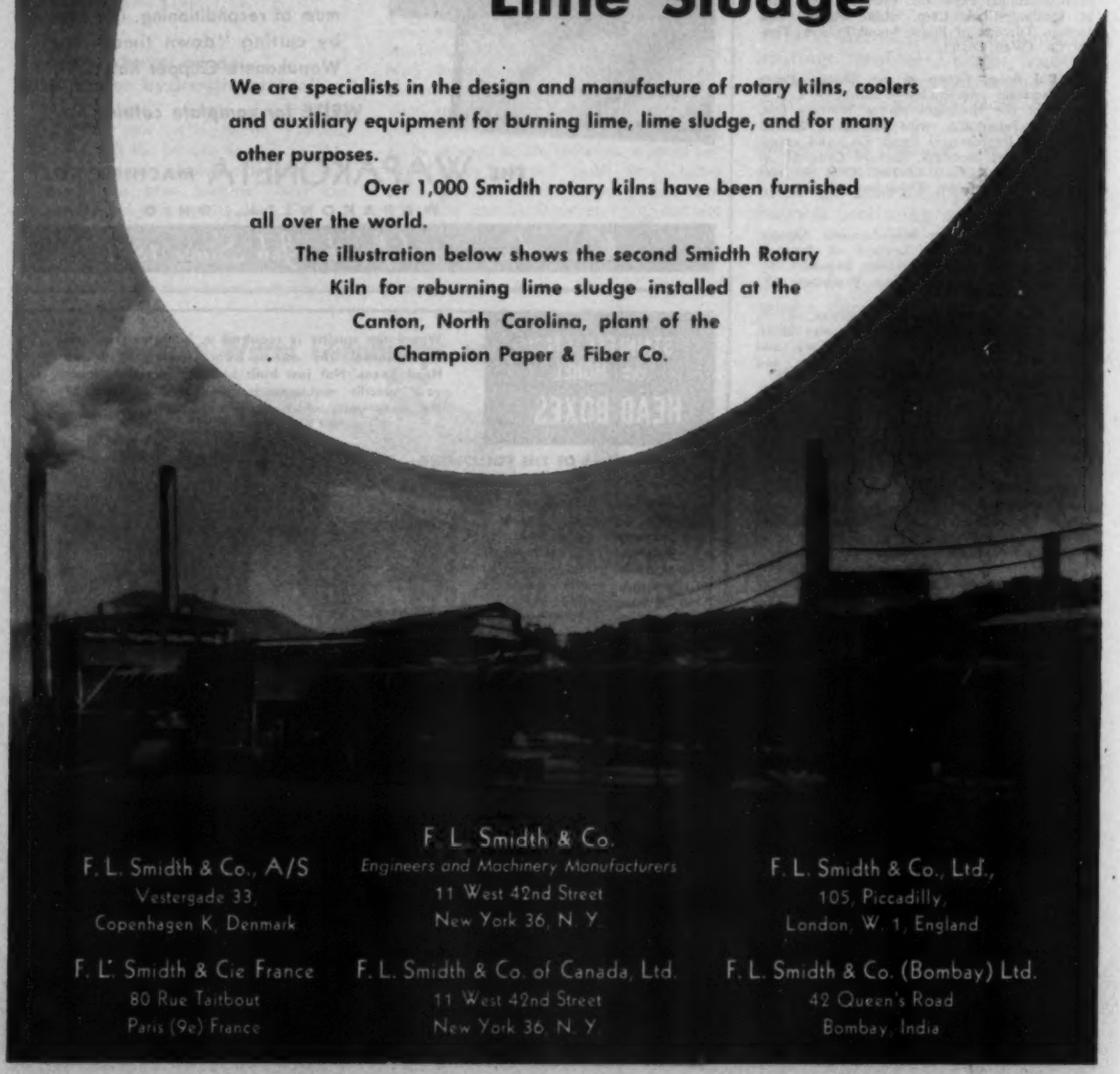

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NEW LITERATURE

Books

DEVELOPING MANAGEMENT ABILITY. By Earl G. Planty and J. Thomas Freeston. Published by Ronald Press, 15 East 26th St., New York 10, N. Y.

Drawing from thousands of questions asked of them by outsiders and from their own experience in industry, the co-authors have selected 600 of the most pertinent queries as the basis for their book.

Using the question and answer technique, carefully indexed, the co-authors have answered broad questions, such as "How do I start a sales training program from scratch,?" in detail, as well as specific problems, including how to handle the executive having no potential for promotion.

Dealing with all phases of the subject, the volume is divided into five major headings: philosophy and psychology underlying development of leadership; methods used in development of men; types of development programs; organizing and operating development activities, and evaluation of results.

PROCESS CONTROL. By A. J. Young. Published by Instruments Publishing Co., 845 Ridge Ave., Pittsburgh 12, Pa. 5¼ x 8¼. 132 pages. $2.00.

This book is designed primarily for the plant engineer, chemist or instrument engineer who wishes to install and operate process control equipment and to take full advantage of it to increase the efficiency of process operation.

The control problem, operation of closed-loop control systems, modes of control, types of controllers available, causes and effects of the time lag and the inherent regulation of process and plant are some of the topics covered in this book, which explains the basic principles, without the use of advanced mathematics, and with emphasis on the factors which are of importance in practical application. Also considered in this volume are pneumatic, electrical, electronic, electro-pneumatic, and mechanical controllers, including those of American, British, and German manufacture.

An important feature of the book is the clarity of explanation, resulting from the adoption of the frequency-response approach, which has recently become popular in the process control field.

Numerous diagrams and graphs are included in this volume.

POSSIBILITIES FOR THE DEVELOPMENT OF THE PULP AND PAPER INDUSTRY IN LATIN AMERICA. Published by the United Nations, New York, N. Y. Distributed by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y. 8½ x 11. 142 pages. $1.50. Paper-bound.

This report is the result of a preliminary joint study by the Economic Commission for Latin America and the Food and Agriculture Organization of the United Nations of the conditions which Latin America can offer for the development of the pulp and paper industry. "The general aims of this report are to determine the future demand for pulp and paper in the region and then compare it with the production capacity of the mills already installed and investigate whether the existing resources can, from both technological and economic standpoints, serve as an adequate basis for the development of the production capacity required in the future."

More than 200 statistical tables are included in this book. Because of a shortage of available data, many of the figures in this report are estimated and are only used to indicate the order of magnitude of the factors studied.

FOREST PRODUCTS RESEARCH GUIDE. Fifth edition. Published by National Lumber Manufacturers Association, 1139 18th St., N. W., Washington, D. C. 8¼ x 10¾. 386 pages. $10.00. Paper-bound.

One of the principal objectives of this new guide, which identifies more than 17,000 research projects conducted by nearly 3,000 organizations in the United States and abroad, is to aid in the correlation of forest products research and to help prevent unnecessary duplication of research activities. It covers projects grouped according to major classifications in research and utilization of wood and other tree products. It also contains a comprehensive listing of research agencies, indexed according to the specific projects they have performed or are still undertaking.

HANDBOOK OF INDUSTRIAL SAFETY STANDARDS. Ninth edition. Published by the Association of Casualty & Surety Companies, 60 John St., New York 38, N. Y. 315 pages. $1.40.

Encompassing 38 chapters and four appendices, this handbook is a compilation of industrial safety requirements recommended by nationally recognized authorities, including the American Standards Association, the National Fire Protection Association, the American Society of Mechanical Engineers and various governmental organizations. However, much of the text material is an amplifica-

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tion and extension of the various codes on which it is based, and some sections deal entirely with topics not covered by any existing standards.

Safety topics covered include: safety programs, accident investigation, materials handling, boilers and unfired pressure vessels, machine guarding, illumination, exhaust systems, electrical equipment, spray coating, tank operations, building exits and prevention of "off-the-job" accidents. Completely new chapters have been added on welding and cutting, storage and handling of flammable liquids, radiation hazards and disaster control. Included in the appendices are an index to American Safety Standards, a table of maximum allowable concentrations of toxic substances and a classification of fire extinguishing appliances.

To lend greater facility to its use, there has been included at the end of most chapters a reference list naming the safety codes which are especially applicable to the subject matter of the chapter.

Booklets and Pamphlets

THE CHEMISTRY OF MELAMINE. Published by American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. 8½ x 11. 31 pages. This new booklet includes sections on applications, specifications, physical properties, chemistry and structure, toxicity, test methods and an extensive bibliography.

MULTI-V BELT ENGINEERING HANDBOOK. Published by B. F. Goodrich Co., Industrial Products Div., Akron, Ohio. 8¾ x 10¾. 76 pages. This handbook features a convenient guide to the design of standard and high capacity drives. New horsepower ratings tables cover speed ratings from 100 to 6,000 fpm. Other subjects covered include: selection of correct multi-V drives, installation and care of V-belt drives, principles of V-belt design, selection of pre-engineered V-V drives, designing a standard V-V drive not in pre-engineered tables, designing V-flat drives, multi-V quarter turn drives and double-V belt drives. A multi-V belt drive calculation sheet is also included. A series of 22 simplified, easy-to-read tables cover

New Literature . . .

installation and take-up allowance, belt speeds, length correction factor, calculation of center distance and a geometry chart for drives. Thirty-one pages of tables are devoted to pre-engineered drives calculated with stock sheaves and stock sizes of V-belts.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Scale Removal. Dowell Inc., Dept. PI, Tulsa 1, Okla.—"Scale Removal from Paper Mill Lines" is the title of a new bulletin which cites case histories of chemical cleaning in green liquor lines, process water system, soda line, white liquor line, service water lines, pulp line, and boiler water line.

Manganese Steel Chain. Taylor-Wharton Iron & Steel Co., Dept. PI, High Bridge, N. J.—A new bulletin describing the various types of "Tisco" manganese steel chain for use in the paper industry and other industries is now available. Photographs of each type of chain are accompanied with detailed drawings and tables giving complete specifications.

Stainless Steel Piping. Babcock & Wilcox Co., Dept. PI, Beaver Falls, Pa.—Data of interest to engineers and designers associated with problems involving stainless piping are included in this new bulletin (TB 356).

Hydraulic Crane. Austin-Western Co., Dept. PI, 601 Farnsworth Ave., Aurora, Ill.—Bulletin AD-2253 describes an indoor-outdoor hydraulic crane, including specifications and performance data, diagrams on working ranges, manual boom extensions, minimum aisle widths for turns, etc. Also described are attachments and special equipment.

Self-Molding Packing & Sealing Compounds. Surveys, Inc., Dept. PI, Trenton, N. J.—This new folder, entitled "Did You Ever Meet Your Silent Partner,"? dramatizes losses sustained through unnecessary leaks and shows how such losses may be eliminated.

Acidizing Service for Water Wells. Dowell Inc., Dept. PI, Tulsa, Okla.—This bulletin which describes Dowell's acidizing service for water wells discusses treatment methods, advantages, and case histories.

Air Traps. Armstrong Machine Works, Dept. PI, Three Rivers, Mich.—Bulletin No. 2022 describes the methods of selecting and installing air traps for automatic drainage of water from compressed air intercoolers, after-coolers, receivers, separators and drip points. Also shown are detail drawings, physical data and list prices of ball float, inverted bucket and snap-action air traps.

Fluid Power Equipment. Oilgear Co., Dept. PI, 1560 W. Pierce St., Milwaukee 4, Wis.—Bulletin 10051-D illustrates and describes Oilgear's complete line of fluid power pumps, motors, transmissions, cylinders, and valves.

Bar Stock. Shenango-Penn Mold Co., Dept. PI, Dover, Ohio—Bulletin 152 offers complete information on both tubular and solid types of bar stock.

Packaged Adjustable-Speed Drive. General Electric Co., Dept. PI, Schenectady 5, N. Y.—The new "B" case "Speed Variator" power unit, a packaged, all-electric adjustable voltage dc drive operating from ac power, is described in this bulletin (GEA-6180), which provides information on design and operating features, ratings and dimensions.

Air Clutch. Dodge Mfg. Co., Mishawaka, Ind.—Bulletin A-634 contains information on the newly-developed "Air-Grips" clutch.

Crown Couplings. De Laval Steam Turbine Co., Dept. PI, Trenton 2, N. J.—Bulletin 2203 describes the De Laval line of crown couplings. Included is an illustration showing an exploded view of the coupling and a table containing data necessary to select the correct coupling for a given application. Prices are specified.

Industrial Rolls. Rodney Hunt Machine Co., Dept. IR, Orange, Mass.—The latest industrial roll engineering report (No. 4) is titled "Combined Torsion and Bending in Roll Shafts." Dealing with torsion or twisting action of a shaft and combined torsion and bending, two basic formulas and typical examples for calculating torque and shearing stress are presented. How to compute the maximum allowable stress for good design and the service factor which is significant with respect to gradual or shock loads is explained.

Air-Break Electric Starters. Electric Controller & Mfg. Co., Dept. PI, 2700 E. 79th St., Cleveland 4, Ohio—Folder 1060 describes a new line of air-break electric starters for 2200-5000 v. motors. It illustrates starters using the Type ZHA 50,000 kva air-break contactor. Many sectional and complete views of each type are detailed and described, along with reproductions of certificates of short circuit tests.

Magnetic Separators. Eriez Mfg. Co., Dept. PI, Erie, Pa.—Catalog No. 17, entitled "Eriez Non-Electric Permanent Magnetic Separators for Removal of Unwanted Iron," is a detailed compilation of the many types of magnetic installations produced by this company.

Synthetic Organic Chemicals. Carbide & Chemicals Co., Dept. PI, 30 E. 42nd St., New York 17, N. Y.—The 1955 edition of the booklet, "Physical Properties of Synthetic Organic Chemicals," presents the latest data on more than 350 organic chemicals. It features 46 new products available from this company.

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WANTED—Aggressive man with experience for position as Finishing Room and Warehouse Superintendent in large Pacific Northwest pulp mill. Replies will be kept strictly confidential. Submit age, education, present and past positions. Address Box 589, The Paper Industry.

WANTED—One young engineer (a) recent ME or EE graduate of recognized college, or, (b) graduate with three to five years experience in power plant or related work. Will work in power plant doing general power plant work, maintenance and operation with some test and design work as needed. Location, South. Address replies to Box 590, The Paper Industry.

WANTED—assistant pulp and paper mill superintendent for Midwest pulp and paper mill. College degree necessary. Age 25-35 years with operating and supervisory experience preferred. Applicant must be capable of operating a pulp mill manufacturing neutral sodium sulphite semichemical .009 corrugating medium. In first letter give complete resume of experience, age, education, and required salary. Address Box 593, The Paper Industry.

Mill making cylinder machine specialty cardboards and bristols has opening for man acquainted with specialty and jobbing trade. Familiarity with laminating operations desired but not necessary. Fine opportunity for right man. Address Box 596, The Paper Industry.

MECHANICAL ENGINEER WANTED

Excellent opportunity for properly qualified mechanical engineer to work for progressive machinery manufacturing concern. Job definition includes project engineering for heavy machinery design, development, and application, working towards advancement in sales engineering or research. Prefer man between ages of 25 to 35 with several years proven experience in the pulp and/or paper industry, who is willing to travel a high percentage of the time. Salary offer outstanding, plus group life and health insurance and retirement pension plan. All expenses prepaid if selected for interview, and all moving expenses paid if hired. Please submit full particulars in first letter. All applications strictly confidential. Reply to Box 594, The Paper Industry.

POTENTIAL SALES ENGINEER WANTED

By established manufacturing corporation of heavy machinery for the pulp and paper industry with large national volume. Age 26 to 35. Must have proven sales ability, preferably in industrial field. College man with mechanical engineering background preferred. Aggressiveness, intelligence, appearance count heavily. Outstanding pay and liberal company benefits. Send in confidence complete resume and snapshot. Expenses for interview paid. If chosen, all moving expenses cared for. Write to Box 595, The Paper Industry.

Paper and Pulp Map of the United States

Size 42" x 58" (Issued as a supplement to the December, 1953 issue of The PAPER INDUSTRY)

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PIQUA, OHIO

MARKET QUOTATIONS

RAGS (Domestic)
NEW RAGS

The following are quotations to mills, f.o.b. New York: per cwt.

No. 1 White Shirt Cuttings	14.50 to 15.00
New Unbleached Muslins	16.50 to 17.00
Fancy Shirt Cuttings	7.50 to 8.00
No. 1 Percales	7.00 to 7.50
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	7.75 to 8.25
No. 1 Light Prints	6.00 to 6.25
Light Flannelettes	8.00 to 8.50
Cottonades	3.75 to 4.00
Blue Overalls	8.00 to 8.50
Blue Cheviots	7.50 to 8.00
Canton Flannels, Bleached	11.50 to 12.00
Canton Flannels, Unbleached	11.50 to 12.00
Osnaburg Cuttings	9.50 to 10.00
Underwear Cuttings, Bleached	16.00 to 16.50
Underwear Cuttings, Unbleached	16.00 to 16.50
Khaki Cuttings—	
Sun Tan	6.75 to 7.00
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.25 to 7.75
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)
OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing	
No. 1	1.25 to 1.35
No. 2	.95 to 1.00
No. 3 and 4	.70 to .80
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.65 to 1.85
Whites, No. 1—	
Repacked	3.75 to 4.00
Miscellaneous	3.25 to 3.50
White, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50

RAGS (Foreign)
ex dock New York City
NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City
OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Sheetings	

ROPE and BAGGING
f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.00 to 5.50
Domestic	5.00 to 5.50
Wool Tares—	
Light	5.00 to 5.25
Heavy	5.25 to 5.50
No. 1 Scrap Bagging	4.00 to 4.50
Manila Rope—	
No. 1 large	5.25 to 5.50
No. 1 small	4.25 to 4.50
Sisal Rope—	
No. 1 large	4.75 to 5.00
No. 1 small	4.25 to 4.50
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.00 to 6.25
Domestic	6.25 to 6.50
Strings—	
No. 1 sisal	4.75 to 5.00
No. 2 sisal	4.25 to 4.50
Soft jute	4.75 to 5.00
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts.	130.00 to 130.00
Hard White No. 1	100.00 to 105.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	60.00 to 65.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	35.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	70.00 to 75.00
New Cuts, One-Cut—	
Extra Manilas	19.00 to 20.00
Manila Tab Cards, Free of Ground Wood	30.00 to 35.00
Colored Tab Cards	55.00 to 60.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	65.00 to 70.00
Overissue	26.00—
No. 1 Folded	20.00—
Old Corrugated Containers	22.00—
New Jute Corrugated Cuts	27.00—
Mill Wrappers	18.00—
Box Board Chips	11.00—
No. 1 Mixed Paper	10.00—

CHEMICALS
f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt	5.05—
Ground, cwt	4.30—
Powdered, cwt	5.10—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder—	
Drums, cwt	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	27.00—
Argentine, lb.	23.00 to 23.50
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.50 to 16.00
Domestic Coating	
Bulk (mine) ton	17.00 to 25.00
Imported (ship side)	
Bulk (imp) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt	2.25—
Gelatine (silicon), lb.	1.25 to 1.25
Glyc. (C.P.) drums, lb.	.29½ to .30
Litharge, powd. bbl. lb.	.16½ to .17

MARKET QUOTATIONS

Rosin (Gum)— New York, per 100 lbs.

E	9.10—
F	9.10—
G	9.10—
WW	9.35—

Rosin (Wood), carlots, F.O.B. South ..... 5.75—

Salt Cake—

Dom. bulk (wks) ton	26.00 to 28.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—

Soda Ash—

Bulk (works) cwt...	1.35—
Paper bags, cwt.....	1.70—

Soda (Caustic)—

Solid drums, cwt....	3.85 to 4.50
Ground and flake, drums, cwt.....	4.25 to 5.00

Sodium Silicate—

60 deg. 55 gal. drums, (works) cwt.....	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.....	1.35 to 1.40

Starch—

Pearl, 140 lb. bags, cwt.	6.39—
Pearl, barrels, cwt...	6.39—
Papor (Sp.) bags, cwt.	6.39—
Powdered, barrels, cwt.	6.60—

Sulphur (Crude)

(Mine) bulk, long ton	26.50 to 28.00

Talc—

Dom. 100 lb. bags (mine) ton.....	35.00 to 38.00
Canadian	35.00 to 45.00

Titanium Dioxide—

Barium Pig, bbls., lb.	.22½ to .23
Calcium Pig, bbls., lb.	.22½ to .23

Zinc Oxide, bags ..... 13.50 to 15.50

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite.....	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite....	120.00—
Unbleached Sulphite, Canadian	125.00—
Bleached Soda.....	140.00—
Bleached Soda, Canadian.	140.00—
Kraft, Bleached.....	145.00—
Kraft, Bleach., Southern.	142.50 to 150.00
Kraft, Bleach., Canadian.	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	105.00 to 110.00
Kraft, Unbleached, Canadian	110.00 to 115.00
Kraft, Semi-Bleached, Southern	130.00 to 135.00
Sulphite Screenings.....	72.50—
Sulphate Screenings.....	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	142.50—
Bleached Sulphite, Norwegian, freight allowed.	135.00 to 140.00
Bleached Sulphite, Finnish, freight allowed.	140.00—
Unbleached Sulphite, Swedish	125.00—
Unbleached Sulphite, Finnish, freight allowed..	125.00—
Kraft, Unbleached, Swedish, freight allowed..	110.00 to 115.00
Kraft, Unbleached, Finnish, freight allowed.	110.00 to 140.00
Kraft, Bleached, Swedish, on dock....	142.50 to 147.50
Kraft, Bleached, Norwegian	

PAPER

Quotations are mill quotations New York City

Boards—

Prices per ton, delivered in New York, 10 tons or more:

Plain chip.....	75.00—
News vat lined chip...	80.00—
Filled news.....	75.00—
Solid news	80.00—
White vat lined chip..	125.00—
Chip tube and can stock.	100.00—
Single manila lined chip.	140.00—
Single jute lined chip..	125.00—
Kraft liner.....	117.50 to 122.50

White patent coated:

.020	155.00—
.018	157.50—
.016	160.00—

Book Paper f.o.b. New York— per cwt.

Machine coated, two sides

70 lb. No. 2 enamel, 25x 38-500, trimmed 4 sides.	4 cases $17.25 Carloads $16.90
45 lb. enamel, 25x38-500, trimmed 4 sides.....	4 cases $13.05 Carloads $12.10

Uncoated

55 lb. No. 2 offset, 25x38 500, trimmed 4 sides....	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

(White, 5,000 to 10,000 lbs., basis 16 lb.)

100% rag.....	58.80—
75% rag.....	45.45—
50% rag.....	36.30—
25% rag.....	29.70—

Rag Content Ledger—

(White, 5,000 to 10,000 lbs.)

100% rag.....	58.80—
75% rag.....	45.45—
50% rag.....	36.30—
25% rag.....	29.70—

Sulphite Bond—

(White, 5,000 to 10,000 lbs., basis 16 lb.)

No. 1.....	19.85—
No. 2.....	19.15—
No. 4.....	17.45—

Sulphite Ledger—

(White, 5,000 to 10,000 lbs.)

No. 1.....	20.20—
No. 2.....	19.50—
No. 4.....	17.80—

News delivered in New York— per ton

Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot).....	(Nominal)
Sheets	133.00—

Tissues (Carlots) f.o.b. New York— per ream

White No. 1.....	1.75—
White No. 2.....	1.85—
Bleached Anti-Tarnish..	2.20—
Colored	2.00—
Anti-Tarnish Kraft....	1.95—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per ct.	1.00—
Napkins, full crepe and embossed (12½ lb. to Mshts.) per ct. ..	1.00—
Toilet, Bleached (M shts.) per ct.....	8.35—
Toilet, Unbleached (M shts.) per ct.....	7.90—

Towels f.o.b. New York— per case

Bleached	6.30—
Unbleached	5.90—

Wrappings (Kraft) f.o.b. New York— (Basis 50 lb. & heavier) per cwt.

Standard wrapping	6.25—
Butchers, counter rolls..	8.50—
Standard bag, mill rolls.	7.75—
Shipping sack, mill rolls.	8.00—
Gumming, mill rolls....	8.25—
Asphalting, mill rolls...	8.00—
Envelope, mill rolls.....	9.50—

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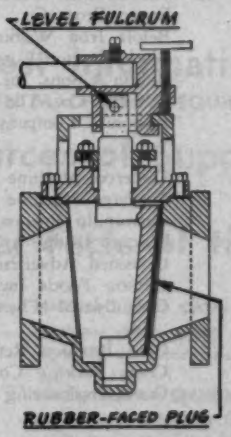

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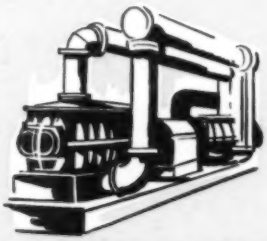
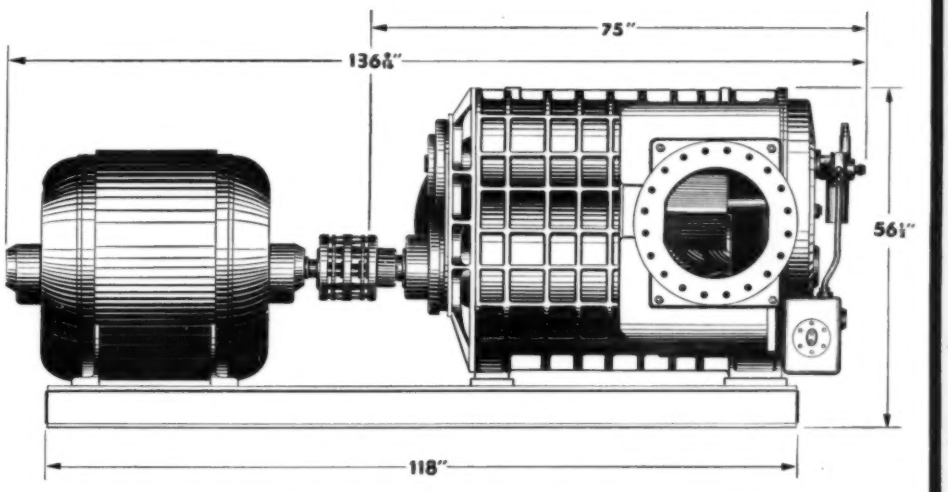
why use two-





400 HP motor
1200 RPM

Standardaire 175x32 Vacuum Pump
75 inches in length, weighs approximately 8,000 lbs.

WHEN ONE WILL DO!

A *Standardaire* Vacuum Pump with low horsepower and single-stage simplicity will do the same job for you as most double-stage pumps . . . and for less.

For example, the *Standardaire* 175x32 Single-stage Vacuum Pump operating at 1200 RPM is conservatively within the range of a 400 HP motor and gives the following tested CFM capacities—

20" HG	*22" HG*	*24" HG*
8,800 CFM	8,600 CFM	8,300 CFM

Figure what this means to you in savings. You can cut production costs, and save on floor space, too. This is possible because the ruggedly built, compactly designed *Standardaire* Pump offers you greater capacity per pound of pump than other pumps of equal weight and size.

Should you wish to stage two *Standardaires*, the same high capacities are achieved with a 25% saving in horsepower.

What's the secret behind the *Standardaire* capacities? Simple, rugged construction and *Standardaire's* exclusive, cycloidal screw type rotors which compress air in a wide range of pressures with a minimum of internal leakage.

There's a *Standardaire* Vacuum Pump designed to meet your exact requirements. Get all the facts today, write . . .

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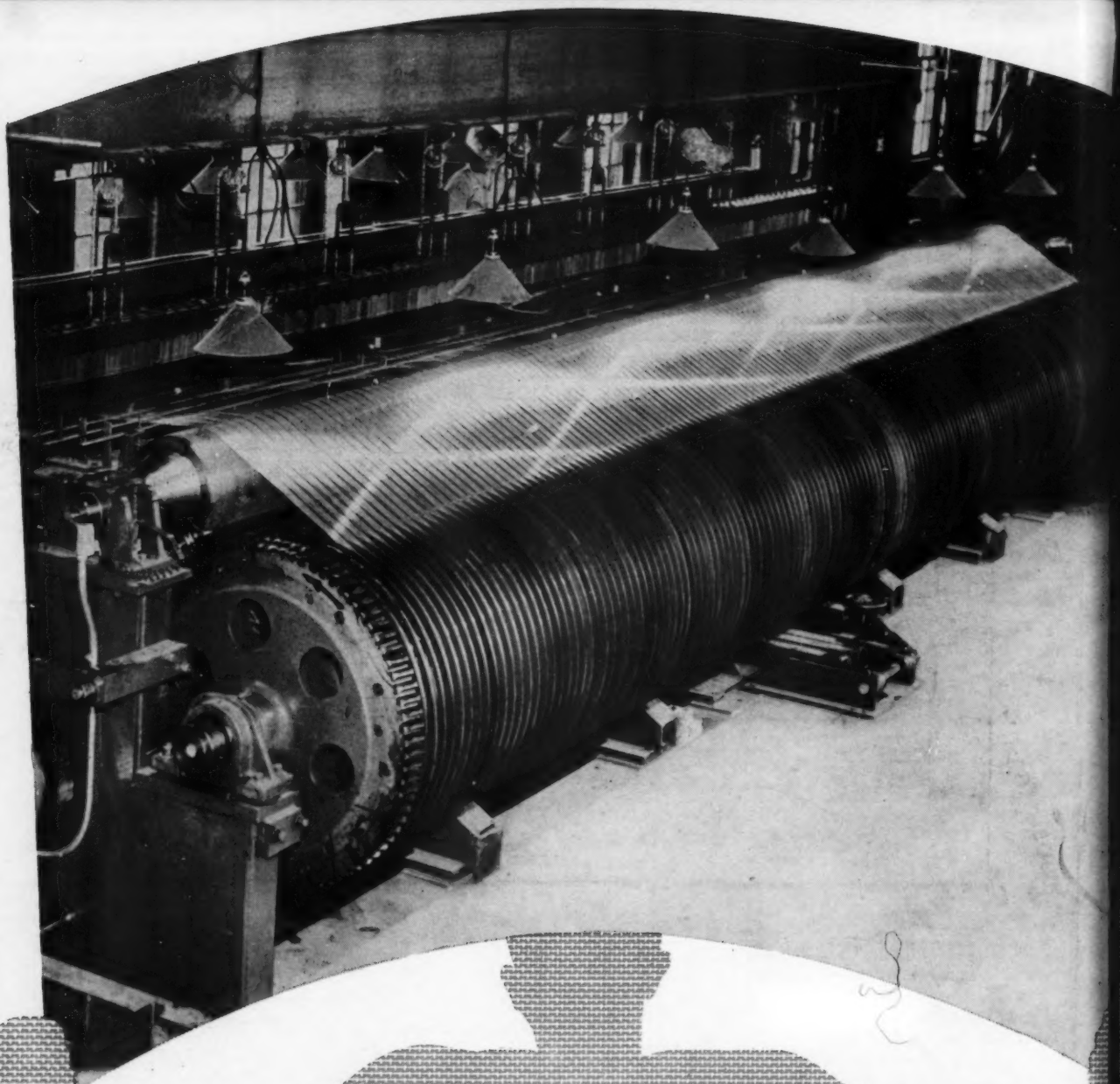

THIS GIANT NEW LOOM—

now weaving fourdrinier wires is the largest in the United States. It can weave wires 292" wide or two 145" wires. Tomorrow may see still larger looms, but whether large, medium, or small, the objective at Eastwood-Nealley is to construct the finest and the most efficient looms in the business. The aim of our continuing modernization program and the goal of our research is to be able to anticipate and meet *in advance* the growing needs of the great pulp and paper industry.

Eastwood-Nealley builds its own wire weaving looms. This loom's push-button controls have made fourdrinier wire production as automatic as is possible, with the added benefit of greater precision.

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